GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF CONTRACT ADMINISTRATION
SPONSORED PROJECT INITIATION

Date: 11/11/80

Project Title: Updating 1972 Peanut Processing Opportunities on the Georgia Tech Portion Which Includes (1) Comparative Plant and Operating Cost Analysis and (2) Transportation Analysis

Project No: A-2806

Project Director: Dr. Tze I. Chiang

Sponsor: Southwest Georgia Planning & Development Commission Ga

Agreement Period: From October 24, 1980 Until October 23, 1981

Type Agreement: Standard Research Project Agreement

Amount: $24,000
$ 5,000 (E-122-209)c/s
$29,000 TOTAL

Reports Required: Quarterly; Final

Sponsor Contact Person (s):

Technical Matters

Mr. Wayne Williams
Director of Research & Gov't
Technical Assistance
Southwest Georgia Planning &
Development Commission
P.O. Box 346
Camilla, GA 31730

Contractual Matters
(thru OCA)

Carroll C. Underwood
Executive Director
Southwest Georgia Planning &
Development Commission
P.O. Box 346
Camilla, GA 31730

Defense Priority Rating:

Assigned to: EDL/ARD (~~School~~/Laboratory)

COPIES TO:

Project Director
Division Chief (EES)
School/Laboratory Director
Dean/Director–EES
Accounting Office
Procurement Office
Security Coordinator (OCA)
✓Reports Coordinator (OCA)
Library, Technical Reports Section
EES Information Office
EES Reports & Procedures
Project File (OCA)
Project Code (GTRI)
Other Project Code (OCA)

CA–3 (3/76)

GEORGIA INSTITUTE OF TECHNOLOGY OFFICE OF CONTRACT ADMINISTRATION

SR 281-4 N1

SPONSORED PROJECT TERMINATION SHEET

Date 10/27/81

Project Title: Updating 1972 Peanut Processing Opportunities on the Georgia Tech portion Which Includes (1) Comparative Plant & Operating Cost Analysis & (2) Transportation Analysis

Project No: A-2806

Project Director: Dr. T. I. Chiang

Sponsor: SW Ga. Planning & Development Comm.

Effective Termination Date: 10/23/81

Clearance of Accounting Charges: 10/23/81

Grant/Contract Closeout Actions Remaining:

- [x] Final Invoice ~~and Closing Documents~~
- [ ] Final Fiscal Report
- [x] Final Report of Inventions
- [ ] Govt. Property Inventory & Related Certificate
- [ ] Classified Material Certificate
- [ ] Other _____

Assigned to: EDL (~~School~~/Laboratory)

COPIES TO:

Administrative Coordinator	Research Security Services	EES Public Relations (2)
Research Property Management	~~Reports Coordinator (OCA)~~	Computer Input
Accounting	Legal Services (OCA)	Project File
Procurement/EES Supply Services	Library	Other _____

FORM OCA 10:781

Project A-2806

UPDATING PEANUT PROCESSING OPPORTUNITIES

Quarterly Report

(October 24, 1980 - January 23, 1981)

Prepared for

Southwest Georgia Planning & Development Commission
Post Office Box 346
Camilla, Georgia 31730

Submitted by

Economic Development Laboratory
Engineering Experiment Station
Georgia Institute of Technology

January 18, 1981

Work Completed or in Progress

In updating the 1971 "Peanut Processing Opportunities," Economic Development Laboratory (EDL) is responsible for preparing two main sections, namely (1) transportation analysis and (2) comparative plant and cost analysis. Work related to these two sections, either completed or in progress, is given separately below:

A. Transportation Analysis

1. The methodology used in updating the transportation analysis will follow the same methods adopted in 1971. Starting points and ending points will remain the same. For distances over 349 miles, carload freight rates will be applied. For those distances under 349 miles, motor truck rates will be used in the analysis.

2. Two major railway systems and two major trucking companies have been contacted to provide freight rates between various starting and ending points on the basis of certain minimum carload/truckload weights. One trucking company already sent in their rates, while the other three companies are still working on requested data.

B. Comparative Plant and Cost Analysis

1. Under this section, investment requirements and production cost analysis are the two major investigating areas. The scale of production, plant location, and the type of end product will follow the same patterns adopted in the 1971 study with the exception that a multi-product line is to be used in the Candy section. Much information needed in this analysis is proprietary in nature. It is difficult to obtain the cooperation of a number of peanut processing companies located in designated areas to provide needed data. EDL has been trying to approach some companies directly for this purpose. Also, Mr. J. Tyron Spearman, Coordinator, Georgia Agricultural Commodity Commission for Peanuts, is seeking such cooperation on the behalf of EDL. However, more efforts are required in order to bring about desirable commitments.

2. Two engineering firms knowledgeable in the plant design of peanut butter processing and salted-nuts processing have promised to provide detailed

data on machinery and production flow diagrams. Other matters concerning investment requirements will be checked with these two engineering firms as well as peanut processing companies.

3. Three trade associations were contacted for their membership directories. A list of producers of peanut butter, salted peanuts, and peanut candy was compiled from these directories. Thirty-five producers were selected because they are located in the pre-designated areas of Southwest Georgia, New York (NY), Chicago (IL), Boston (MA), Cincinnati (OH), and Suffolk (VA). A very brief survey questionnaire was sent to each of these 35 producers for the purpose of finding out their willingness to participate in this program by contributing their production information. Twelve of them have responded so far, with seven affirmative answers and five negative answers. A follow-up questionnaire was sent to each of the non-responding companies after a 4-week lapse.

Work Projected in the Next Quarter

A. Transportation Analysis

1. Railroad transportation rates and trucking rates between various starting points and ending points are expected to be completed by the cooperating agencies and to be delivered to EDL. Based on these rates, relative transportation costs on specific peanut products can be computed on the basis of distance, weight, and market size.

B. Comparative Plant and Cost Analysis

1. A questionnaire will be designed to collect detailed production data on each of the peanut products covered under this study. These questionnaires can be sent to cooperative companies which are willing to contribute their information. In-depth personal interviews are likely to be required in order to bring out some sensitive trade information which is not likely to be revealed by a mail survey.

2. Some basic information concerning land value, building cost, wage rate, utility rate, tax rate, insurance rate, material costs, etc., on several selected locations can be obtained by contacting different institutions and authorities. These data are essential in computing production costs and in projecting returns.

3. Will continue to contact the two engineering firms which are cooperating with EDL for providing production models on peanut butter and salted peanuts.

4. It is essential to obtain the cooperation of at least one multi-products candy producer to provide needed information on investment and production costs. The assistance from Mr. J. Tyron Spearman, GACCFP, in obtaining such cooperation is essential.

Project A-2806

UPDATING PEANUT PROCESSING OPPORTUNITIES
Quarterly Report
(January 24, 1981 - April 23, 1981

Prepared for
Southwest Georgia Planning & Development Commission
Post Office Box 346
Camilla, Georgia 31730

Submitted by
Economic Development Laboratory
Engineering Experiment Station
Georgia Institute of Technology

April 18, 1981

Work Completed or in Progress

A. Transportation Analysis

1. Basic railroad transportation rates on shelled peanuts, peanut butter, salted peanuts, peanut brittle, and peanut oil from various starting and ending points in different rate territories have been obtained. The Southern Railway System and the Family Lines System spent considerable time in compiling these rates for this study program. These rates are based on a certain minimum carload weight with additional fuel surcharges. These rates will be used on those distances over 349 miles.

2. Basic motor-carrier rates on shelled peanuts, peanut butter, salted peanuts, peanut brittle, and peanut oil from various starting and ending points have been obtained. After considerable efforts and persuasion, several trucking firms have overcome their suspicion and finally supplied these rates. Under the current deregulated conditions, these rates are competitive. The obtained rates are based on a certain minimum truckload weight with additional fuel surcharges. These rates will be used on those distances under 349 miles.

B. Comparative Plant and Cost Analysis

1. Five locations have been selected as the production centers for peanut products. The locations are Albany (GA), Chicago (IL), New York (NY), Cincinnati (OH), and Suffolk (VA). Basic information concerning land value, building cost, wage rate, utility rate, tax rate, insurance rate, material costs, etc. on the five selected locations have been collected.

2. Three questionnaires were designed to collect production data on peanut butter, salted peanuts, and peanut candy. These questionnaires were sent to 35 companies engaged in the production of peanut products in the five selected locations. Nineteen of them have responded so far and five of them gave desirable information.

3. On February 16, 1981, a memorandum was sent to all parties involved in this study program that peanut brittle will be kept as the product model under the peanut candy section.

4. Several intensive interviews with a major peanut brittle producer took place. Detailed estimates on investment requirements, production costs, and projected returns on two output models for the production of peanut brittle were completed. The estimates were made on the basis of three different production locations. They are southwest Georgia and the metro areas of New York and Chicago.

Work Projected in the Next Quarter

A. Transportation Analysis

1. Expect to receive the market data on the basis of national, regional, and local volume on the different peanut products from Dr. Robert Raunikar. These market data will be applied to freight rates in order to make estimates on transportation costs.

B. Comparative Plant and Cost Analysis

1. Expect to complete a rough draft on peanut brittle.

2. Will continue to urge the two engineering firms to provide information on investment requirements for the production of peanut butter and salted peanuts. They have promised to do that but the priority of this work is low on their schedule.

Project A-2806

UPDATING PEANUT PROCESSING OPPORTUNITIES
Quarterly Report
(April 24, 1981 - July 23, 1981)

Prepared for
Southwest Georgia Planning & Development Commission
Post Office Box 346
Camilla, Georgia 31730

Submitted by
Economic Development Laboratory
Engineering Experiment Station
GEORGIA INSTITUTE OF TECHNOLOGY

July 20, 1981

Work Completed or in Progress

A. Transportation Analysis

1. Based on basic transportation rates provided by railroad systems and motor carrier companies, an analysis on transportation costs from peanut processing centers to various market destinations was completed.
2. A draft report on the transportation - analysis section was completed. The report covers methodology, peanut butter, peanut brittle, salted peanuts, and peanut oil. Extensive data on basic transportation rates are included as appendices.

B. Comparative Plant and Cost Analysis

1. Basic data on investment requirements for peanut butter and salted peanuts processing were obtained from a leading engineering firm and from several equipment vendors.
2. The analysis on production costs and projected returns was completed on peanut butter, peanut brittle, and salted peanuts. As in the 1971 study, peanut oil was mentioned only without giving detailed cost analysis.
3. A draft report on the section of comparative plant and cost analysis was completed.

Work Projected in the Next Quarter

1. Final typing on the draft report is expected to be done in the next quarter.
2. Tables, charts, and figures will be finalized and completed.
3. An effort of coordination will be made with the Southwest Georgia APDC concerning the format of the final report.

Project A-2806

Transportation Analysis for Updating the Study on Peanut Processing Opportunities

Prepared for
Southwest Georgia Planning and Development Commission
Post Office Box 346
Camilla, Georgia 31730

Submitted by
Economic Development Laboratory
Engineering Experiment Station
Georgia Institute of Technology

September 1981

Contents

	Page
METHODOLOGY FOR TRANSPORTATION ANALYSIS	1
TRANSPORTATION ANALYSIS FOR PEANUT BUTTER	9
TRANSPORTATION ANALYSIS FOR PEANUT BRITTLE	17
TRANSPORTATION ANALYSIS FOR SALTED PEANUTS	23
TRANSPORTATION ANALYSIS FOR PEANUT OIL	31
APPENDICES	32

METHODOLOGY FOR TRANSPORTATION ANALYSIS

A study of transportation economics in the peanut products industry was conducted to determine the possible advantages and disadvantages of a processor located in the Georgia producing area. To determine the feasibility of locating a plant in the that area, it was necessary to designate an appropriate site. Any site having adequate facilities for a plant could have been used in the study. For the purposes of this study, Albany was arbitrarily selected to represent southwest Georgia.

The modes of transportation used in shipping both shelled peanuts and final products were determined by a previous survey of shellers and interviews with peanut product processors. To compare the transportation costs of an Albany plant, other processing locations were identified. The selection of these processing centers was based on the location of the competition. For example, Suffolk, Va., was chosen as one of the points of comparison in the analysis of salted peanuts because it leads the nation in the production of that item.

Rail rates for shelled peanuts, short line rail mileages between growing areas and processing centers, and short line rail mileages between market regions and processing centers are given in Tables 1, 2, and 3.

After processing centers comparable to Albany had been selected for each product under study, freight rates from each of the processing centers to the 26 market regions were collected. Since rail freight rates are usually lower than motor-carrier rates on large shipments over long distances, it was decided that rail freight rates would be used for distances over 349 miles.

Rail rates consist of either class or commodity rates. Commodity rates generally are lower than class rates. Rail carriers usually act unilaterally, or in connection with other railroads, with and without requests from shippers, to set freight rates. On all regulated commodities the rate tariffs are filed with the Interstate Commerce Commission. Commodity rates specify a volume minimum and are determined for transport between specific points, whereas class rates apply to all items moving from all regions to all destinations. Although class rates are more generally applicable, most railroad traffic (perhaps 90 percent or more in terms of ton-miles) moves under commodity rates.

Peanut product or shelled-peanut commodity rates were supplied by two major railroad systems for supply-demand routes on a minimum-carload weight. These rates were given in basic rates per hundredweight plus fuel surcharges. The fuel surcharges are equivalent to 2.2 percent or 3.4 percent of the given basic rates, depending on specific routes. For realistic costing purposes, an additional 30 cents per hundredweight was added to the given basic rates to account for transportation costs between the railroad station and the peanut

processing plant. Railroad transportation, unlike motor carriers, requires trucks for local hauling.

For routes between processing centers and market regions under 350 miles away, motor-carrier rates were used. The existing motor-carrier rates were collected for these routes, and rates for minimum truckloads of 30,000 pounds were chosen for the analysis. These rates are also given as basic rates plus fuel surcharges on a per hundred-weight basis.

Because transportation costs are based on actual commodity rates for each product and for each supply-demand route, a comparative analysis of processing center locations was conducted.

Average freight costs were calculated from the selected processing centers to national, eastern, and southeastern markets for each product under study (see Figure 1). Average freight cost was calculated by determining the percentage of the total market (national, eastern, or southeastern) represented by each market region and multiplying the corresponding portion of the processor's output by the freight rate to each region; the sum of the freight costs to all the regions is the average freight cost to serve the overall market area. (If, for example, the estimated demand for a product in the Miami market region was 10 percent of the national market, it was assumed that a processor serving the national market would ship 10 percent of his output to this region at the freight rate established for the processor-to-Miami route.)

This average freight cost, then, requires that buyers in the aggregate pay for transportation costs from the processor to the market. If the processor followed the practice of quoting prices on a freight-allowed basis (where the price of his product is uniform on a delivered basis) to all buyers in a particular market region, then the average freight cost would be the amount added to the processor's f.o.b. price to determine the uniform price. The average freight cost times the shipping weight of the processor's product will give the freight bill for the processor. It should be remembered that the freight bill calculated here accounts only for distribution to the selected cities in the market region.

Although the freight bill does not reflect additional distribution costs entailed in transportation to other points within the market region, it probably approximates the actual freight cost very closely. For example, the freight rate used by a Los Angeles processor (when shipping his product to an East Coast point) is applicable to other points located in the same freight rate territory.

The estimated demand for the 26 market regions was calculated in terms of each product's equivalent in shelled peanuts, and the equiv-

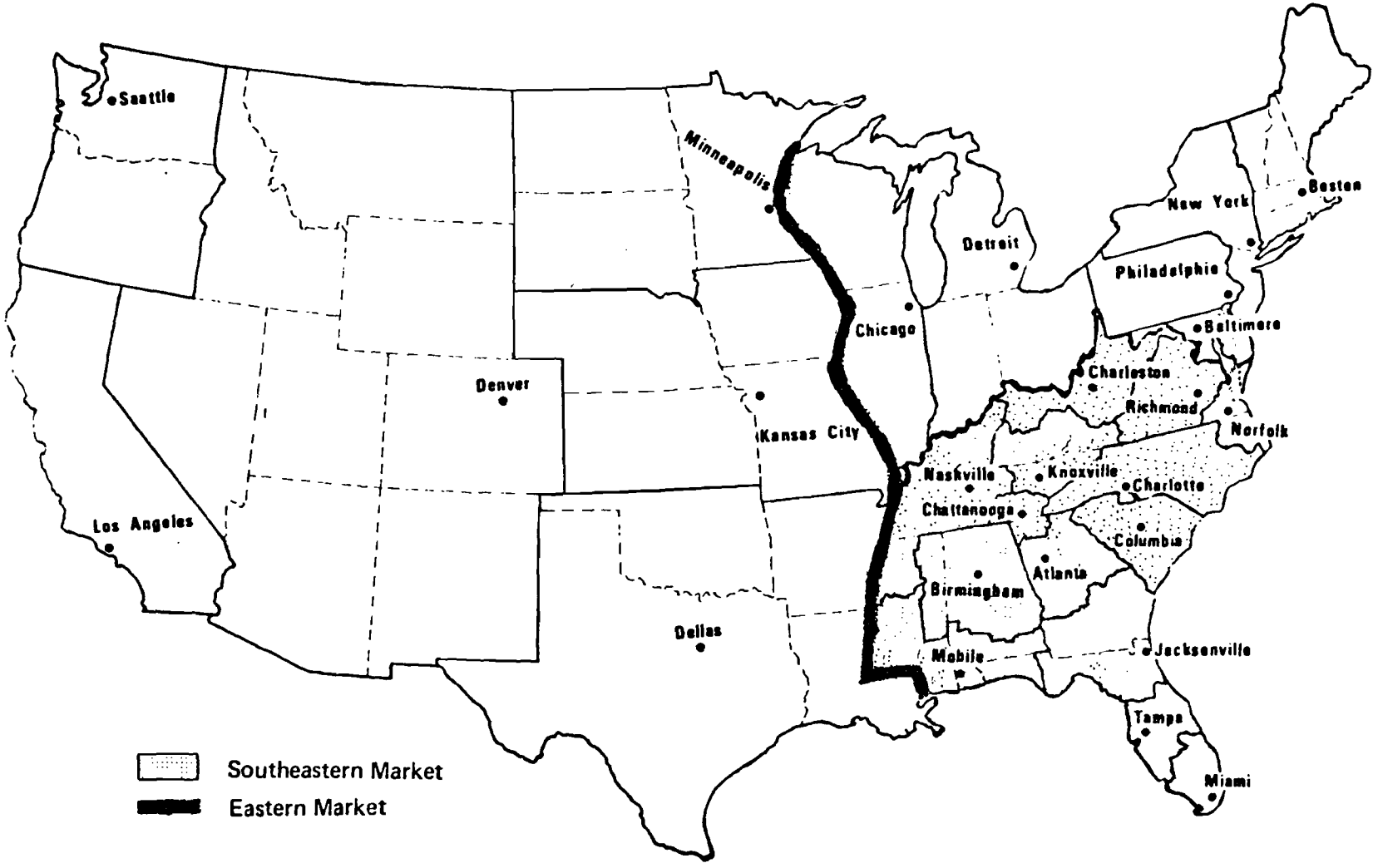


Figure 1. Boundaries of the national, eastern and southeastern markets for peanut products.

alent of product shipping weight to the weight of shelled peanuts was calculated for each product (see Table 4). For example, in peanut butter production, 100 pounds of shelled peanuts are equivalent to about 170 pounds of peanut butter, packaged for shipment. Therefore, the freight bill for final product shipment is calculated on the basis of 170 pounds weight. In essence, the shipping weight of peanut butter (final product), is increased by 70 percent. Other products were treated in a similar fashion. The details of shipping weight on each product are presented in Table 4.

Table 1. Shelled peanut railroad rates from growing areas to processing centers, 1981 (rates in cents per hundred pounds)

Destination	Minimum Carloads (Pounds)			
	70,000		100,000	
	A	B	A	B
From Abilene, Texas (Southwest)				
Albany, Ga.	200	207		
Cincinnati, Oh.	191	197	185	191
Dallas, Tex.	67	69	61	63
Los Angeles, Cal.	263	272	237	245
Suffolk, Va.	281	291	265	274
From Albany, Georgia (Southeast)				
Chicago, Ill.	169	175	151	156
Cincinnati, Oh.			130	133
Los Angeles, Cal.	416	430	374	387
New York, N.Y.	217	222		
Suffolk, Va.	128	132	113	117
From Suffolk, Virginia (Virginia-North Carolina)				
Chicago, Ill.	176	180	153	156
Cincinnati, Oh.	137	140	129	132
Los Angeles, Cal.	513	530	460	476

Source: Family Lines System

A = Basic rates
B = Basic rates plus fuel surcharges

Table 2. Short line rail mileage between peanut growing areas and peanut product processing centers (in miles).

Processing Centers	Growing Areas		
	Southwest (Abilene, Tex.)	Southeast (Albany, Ga.)	Virginia-North Carolina (Suffolk, Va.)
Albany, Ga.	1,004		652
Chicago, Ill.	1,073	890	897
Cincinnati, Oh.	1,123	652	638
Dallas, Tex.	174	831	1,400
Los Angeles, Cal.	1,267	2,402	2,840
New York, N. Y.	1,816	1,009	371
Suffolk, Va.	1,573	652	

Source: Family Lines System.

Table 3. Short-line mileage between market regions and peanut product processing centers (in miles).

Market	Peanut Product Processing Centers						
	Albany, Ga.	Chicago, Ill.	Cincinnati, Oh.	Dallas, Tex.	Los Angeles, Cal.	New York, N. Y.	Suffolk, Va.
Southeast							
Atlanta, Ga.	182	724	470	842	2,282	866	563
Birmingham, Ala.	244	644	480	676	2,116	990	724
Charleston, W. Va.	729	460	203	1,123	2,480	613	438
Charlotte, N. C.	403	829	553	1,099	2,539	606	303
Chattanooga, Tenn.	315	591	338	797	2,235	847	612
Columbia, S. C.	309	850	574	1,070	2,510	707	348
Jacksonville, Fla.	187	1,055	801	1,018	2,458	967	596
Knoxville, Tenn.	377	560	284	908	2,346	736	501
Miami, Fla.	532	1,401	1,147	1,361	2,801	1,333	942
Mobile, Ala.	325	837	737	614	2,054	1,216	913
Nashville, Tenn.	451	439	295	714	2,152	999	764
Norfolk, Va.	670	914	656	1,418	2,858	353	20
Richmond, Va.	670	825	568	1,363	2,801	346	82
Tampa, Fla.	311	1,199	948	1,140	2,580	1,155	784
Non-Southeast							
Baltimore, Md.	828	767	560	1,463	2,821	201	247
Boston, Mass.	1,236	973	891	1,813	3,080	247	598
Chicago, Ill.	890		283	934	2,128	890	897
Dallas, Tex.	831	934	951		1,441	1,644	1,400
Denver, Colo.	1,495	1,006	1,209	785	1,252	1,887	1,847
Detroit, Mich.	906	267	254	1,125	2,375	631	789
Kansas City, Mo.	953	437	599	503	1,681	1,289	1,237
Los Angeles, Calif.	2,402	2,128	2,280	1,441		2,970	2,840
Minneapolis, Minn.	1,240	395	678	974	2,102	1,188	1,292
New York, N. Y.	1,009	890	724	1,644	2,970		371
Philadelphia, Pa.	916	814	644	1,551	2,894	100	279
Seattle, Wash.	2,837	2,092	2,418	2,223	1,260	2,914	2,986

Source: Family Lines System.

Table 4. Shipping weight of peanut product equivalent to one pound of shelled peanuts (in pounds).

Commodity	Shelled Peanuts Received	Processing Loss	Shelled Peanuts Usable	Processing Additives[a/]	Product Weight	Packaging Weight	Shipping Weight
Peanut Butter	1.00	.10-.14	.86-.90	.10-.14	1.00	.60-.80	1.60-1.80
Salted Peanuts	1.00	.06-.09	.91-.94	.03-.04	.94-.98	.16-.45	1.10-1.43
Peanut Brittle	1.00	.04-.10	.90-.96	1.80-1.92	2.70-2.88	.27	2.97-3.15
Refined Peanut Oil	1.00	0	1.00	(.57-.59)	.41-.43	.10-.67	.51-1.10

[a/] Parentheses indicate a processing loss.

TRANSPORTATION ANALYSIS FOR PEANUT BUTTER

A study of transportation economics in the peanut butter industry was conducted to determine the possible advantages or disadvantages of locating processor in Albany, Ga. Albany was chosen as a representative location in the Georgia producing region. No attempt was made in the study to identify a particular location in the region that would be most advantageous. Any firm considering locations in the region would have to evaluate alternative sites.

Areas in the nation where peanut butter processing is concentrated were identified so their transportation costs could be compared with those of an Albany plant. Analysis of the existing market structure revealed a concentration of peanut butter processors in the Chicago-Cincinnati region. Points chosen for comparison with Albany were Chicago, Cincinnati, Dallas, Los Angeles, New York, and Suffolk.

Rail rates were used for movements of more than 349 miles and motor-carrier rates for those under that distance. Each selected processing center had an established peanut butter commodity rate structure for rail transportation. Some had a more highly developed commodity structure for peanut butter than Albany. These processing centers had established higher minimum carloads; hence, they enjoyed lower freight rates, which were probably for routes with a larger volume of traffic.

A number of factors other than freight rates affect the selection of the appropriate size of shipment for a route. Market size, the processor's warehousing system, and product rotation at the retail level all affect the size of shipment and, therefore, freight costs. In this analysis, commodity rates for rail movement of peanut butter were based on minimum carloads of 120,000 pound, and for motor-carrier shipment, minimum truckloads of 30,000 pounds. Shipment of shelled peanuts by rail was based on 70,000-pound minimum carloads, while the motor-carrier minimum truckload shipment was based on 30,000 pounds. (see Appendices 1-7.)

Comparative Freight Bill Analysis -- A comparative analysis of the transportation costs of peanut butter processing centers was conducted, using actual commodity rates plus fuel surcharges for each supply-demand route of peanut butter and shelled peanuts. Thirty cents per hundredweight were added to railroad rates for local transportation.

It was assumed that peanut butter processors follow the practice of quoting prices on a freight-allowed basis. This policy allows a processor to price a product on a uniform delivered basis to all buyers in a particular market without regard to the distance of product shipment. To determine this uniform price, an amount must be added to the processor's f.o.b. price which would cover the processor's total cost of peanut butter transportation. This amount,

an average freight cost, was calculated for each of the processing centers, based on service to national, eastern, and southeastern markets as shown in Table 5.

Table 5. Average freight costs from peanut butter processing centers.

Processing Center	National Market	Eastern Market	Southeastern Market
	(Cents Per Hundredweight)		
Albany, Ga.	225	191	159
Chicago, Ill.	220	203	200
Cincinnati, Oh.	227	194	185
Dallas, Tex.	275	284	246
Los Angeles, Cal.	435	475	470
New York, N.Y.	250	198	208
Suffolk, Va.	224	169	165

Although Table 5 shows average freight costs for shipments of peanut butter, it does not reflect the total cost of transportation to the processors. Total transportation costs consist of the cost of shipments of shelled peanuts to processors as well as the cost of peanut butter shipments. Freight bills have been calculated for southeastern, eastern, and national markets to provide a basis for comparison of transportation costs.

Retail demand for peanut butter in the southeastern market was estimated at 117,447,000 pounds in 1979. It was assumed that this market was served by a regional peanut butter processor with a plant production of 16 million pounds or a national processor which shipped 32 million pounds to the southeastern market. The processor would have about a 13.6 percent share of the southeastern market.

Freight bills for the seven processors, based on this assumption of a 16-million-pound share of the southeastern market, are shown in Table 6. The table shows that an Albany location for a peanut butter processor serving the southeastern market, offers a transportation advantage over the points chosen for comparison. For example, a Chicago processor selling 16 million pounds of its particular brand of peanut butter in the southeastern market could save $321,120 on transportation costs by opening a facility in Albany.

The eastern market demand was estimated at 379,222,000 pounds of peanut butter in 1979. It was assumed that a peanut butter processor ships 32 million pounds to this market, which represents approximately 8.4 percent penetration of the eastern market. The freight advantage an Albany peanut butter processor would have in the eastern market is not so great as it would be in the southeastern market (See Table 7).

Albany shows a freight advantage over Chicago, Cincinnati, Dallas, Los Angeles, and New York, based on the assumption that shelled peanut shipments to each processor are from the growing area with the lowest transportation costs to that processor. Only Suffolk shows a slight freight advantage over Albany to the eastern market.

The national market for peanut butter was estimated at 596,473,000 pounds in 1979. It was assumed that the yearly production of a national peanut butter processor would be 32 million pounds, which would represent a penetration of the national market of about 5.4 percent. Table 8 shows that the Albany peanut butter processor would have a freight advantage over all the processors except those located in Suffolk. The freight disadvantage of the Albany plant would be slight compared with a Suffolk plant which received its supply of peanuts from the Virginia-Carolina growing area; it would amount to approximately $5,440.

Table 6. Comparative freight bills for peanut butter centers, shipping 16 million pounds yearly to the southeastern market, 1981.

Processing Center	Freight Rates		Freight Bills			Freight Advantage for Albany Processor
	Shelled Peanut[a]	Peanut Butter[b]	Shelled Peanut[c]	Peanut Butter[d]	Total	
	Cents Per Hundredweight		Dollars			
Albany, Ga.	55	159	$ 88,000	$ 432,480	$ 520,480	
Chicago, Ill.	186	200	297,600	544,000	841,600	$ 321,120
Cincinnati, Oh.	164	185	262,400	503,200	765,600	245,120
Dallas, Tex.	80	246	128,000	669,120	797,120	276,640
Los Angeles, Cal.	275	470	440,000	1,278,400	1,718,400	1,197,920
New York, N. Y.	254	208	406,400	565,760	972,160	451,680
Suffolk, Va.	55	165	88,000	448,800	536,800	16,320

[a] Freight rates based on 30,000-pound minimum truckload or 70,000-pound minimum carload shipments.

[b] See Table 5.

[c] Calculation based on 16 million pounds of shelled peanuts.

[d] Calculation based on net product weight of 16 million pounds times 1.70 to obtain 27.2 million pounds shipping weight.

Table 7. Comparative freight bills for peanut butter centers, shipping 16 million pounds yearly to the eastern market, 1981.

Processing Center	Freight Rates		Freight Bills			Freight Advantage for Albany Processor[e]
	Shelled Peanut[a]	Peanut Butter[b]	Shelled Peanut[c]	Peanut Butter[d]	Total	
	Cents Per Hundredweight		Dollars			
Albany, Ga.	55	191	$ 88,000	$ 519,520	$ 607,520	
Chicago, Ill.	186	203	297,600	552,160	849,760	$ 242,240
Cincinnati, Oh.	164	194	262,400	527,680	790,080	182,560
Dallas, Tex.	80	284	128,000	772,480	900,480	292,960
Los Angeles, Cal.	275	475	440,000	1,292,000	1,732,000	1,244,480
New York, N. Y.	254	198	406,400	538,560	944,960	337,440
Suffolk, Va.	55	169	88,000	459,680	547,680	(59,840)

[a] Freight rates based on 30,000-pound minimum truckload or 70,000-pound minimum carload shipments.

[b] See Table 5.

[c] Calculation based on 16 million pounds of shelled peanuts.

[d] Calculation based on net product weight of 16 million pounds times 1.70 to obtain 27.2 million pounds shipping weight.

[e] Parentheses indicate disadvantage for Albany.

Table 8. Comparative freight bills for peanut butter centers, shipping 32 million pounds yearly to the national market, 1981.

Processing Center	Freight Rates		Freight Bills			Freight Advantage for Albany Processor[e]
	Shelled Peanut[a]	Peanut Butter[b]	Shelled Peanut[c]	Peanut Butter[d]	Total	
	Cents Per Hundredweight		Dollars			
Albany, Ga.	55	225	$ 176.00	$1,224,000	$1,400,000	
Chicago, Ill.	186	220	595,200	1,196,800	1,792,000	$ 392,000
Cincinnati, Oh.	164	227	524,800	1,234,880	1,759,680	359,680
Dallas, Tex.	80	275	256,000	1,496,000	1,752,000	352,000
Los Angeles, Cal.	275	435	880,000	2,366,640	3,246,640	1,846,640
New York, N. Y.	254	250	812,800	1,360,000	2,172,800	772,800
Suffolk, Va.	55	224	176,000	1,218,560	1,394,560	(5,440)

[a] Freight rates based on 30,000-pounds minimum truckload or 70,000-pound minimum carload shipments.

[b] See Table 5.

[c] Calculation based on 32 million pounds of shelled peanuts.

[d] Calculation based on net product weight of 32 million pounds times 1.70 to obtain 54.4 million pounds shipping weight.

[e] Parentheses indicate freight disadvantage for Albany.

Freight Cost Evaluation -- The preceding analysis only considered transportation costs. It is important, however, to consider transportation costs in relation to other plant costs. How significant are transportation costs as compared with other plant costs? Interviews with peanut butter processors revealed that none had a firm idea about what percentage transportation costs represented in relation to relevant or total costs, although they did know the average cost of finished product transportation. The average freight cost for final product shipment was approximately 4 to 5 percent of production costs, depending upon the size of the market served, the operating basis of the carrier utilized (common carrier, contract, or company-owned), and the mode of transportation (rail or motor carrier).

Total cost of transportation as compared with relevant costs and total cost of plant operation was estimated for processors located at Albany, Chicago, and Cincinnati (Table 9), utilizing estimated annual cost data for plants, serving the southeastern, eastern, and national markets. In terms of the southeastern market, the total transportation cost of an Albany plant represents only about 3.2 percent of the total annual cost. Total transportation costs for the three locations, serving the eastern market, range from 3.8 to 4.9 percent of total plant costs; for the national market, they range from 4.3 to 5.3 percent. However, looking at relevant costs, that is, those costs that vary from location to location such as labor, utilities, transportation, general expenses, and other miscellaneous variables (in other words, all costs except materials cost and sales expenses), transportation represents about 29.7 percent of relevant costs for an Albany plant serving the southeastern market. Transportation costs for plants serving the eastern market vary from 33.1 to 34.7 percent of relevant costs, and transportation costs for processors serving the national market range from 41.3 to 42.3 percent.

Table 9. Total transportation costs as a percentage of total costs and relevant costs for selected peanut butter processing centers.

Market and Processing Centers	Total Transportation Costs[a/]	Total Plant Costs[b/]	Relevant Plant Costs[c/]	Transportation Cost as a Percentage of Total Costs	Transportation Cost as a Percentage of Relevant Costs
Southeastern					
Albany	$ 520,480	$ 16,164,274	$ 1,749,693	3.2	29.7
Eastern					
Albany	607,520	16,164,274	1,749,693	3.8	34.7
Chicago	849,760	17,280,620	2,531,479	4.9	33.6
Cincinnati	790,080	17,17,586	2,386,212	4.6	33.1
National					
Albany	1,400,000	32,559,048	3,343,964	4.3	41.8
Chicago	1,792,000	33,834,450	4,336,166	5.3	41.3
Cincinnati	1,759,680	33,727,894	4,159,210	5.2	42.3

a/ See previous tables.

b/ Costs calculated in the comparative plant and operating cost analysis.

c/ Relevant costs are those which, as opposed to constant costs, vary from location to location.

TRANSPORTATION ANALYSIS FOR PEANUT BRITTLE

The transportation economics of the peanut brittle industry were studied to determine the possible advantages or disadvantages of locating a processor in the Georgia producing area.

Since information on the location of peanut brittle processing was not available, data on the peanut candy industry were used to identify areas of processing concentration. The transportation costs of these areas were compared with those of an Albany plant. An analysis of the existing market structure revealed a concentration of peanut candy processors in the northeast and midwest regions of the United States. Those points chosen for comparison with Albany were Chicago, Ill.; Los Angeles, Cal.; and New York, N. Y.

Peanut brittle, unlike the other peanut products under study, is not composed primarily of peanuts. Peanuts, corn syrup, and sugar each constitutes by weight approximately a third of peanut brittle. This analysis, therefore, is concerned with the movement of both shelled peanuts and the final product.

Rail rates were used for movements over 349 miles and motor-carrier rates for those under that distance. Each of the selected processing centers had an established commodity rate structure for rail transportation of peanut candy.

A number of factors other than freight rates affect the selection of the appropriate size of shipment for a route. The size of the market, the processor's warehousing system, and the practice of product rotation at the retail level all would affect the size of shipment and, therefore, the freight cost. For the purpose of this analysis, the commodity rates for rail movement of peanut candy were based on minimum carloads of 60,000 pounds. For motor-carrier shipment, rates were based on minimum truckloads of 30,000 pounds. The shipment of shelled peanuts by rail was based on 70,000-pound minimum carloads, while the motor-carrier minimum truckload shipment was based on 30,000 pounds (see Appendice 8-11).

Comparative Freight Bill Analysis

A comparative analysis of the transportation costs of peanut brittle processing centers was conducted, using actual commodity rates plus fuel surcharges for each supply-demand route of peanut candy and shelled peanuts. Thirty cents per hundredweight was added to the railroad rate for local transportation.

It was assumed that peanut brittle processors follow the practice of quoting prices on a freight-allowed basis since a number of companies used this pricing policy. This policy allows the processor to price his product on a uniform delivered basis to all buyers in a particular market without regard to the distance of product shipment.

To determine this uniform price, which would cover the processor's total cost of peanut brittle transportation, an amount must be added to the processor's f.o.b. price. This amount, an average freight cost, was calculated for each of the processing centers, based on service to the national, eastern, and southeastern markets, and is shown in Table 10 below.

Table 10. Average freight costs for national, eastern, and southeastern markets from the four peanut brittle processing centers.

Processing Center	National Market	Eastern Market	Southeastern Market
	(Cents Per Hundredweight)		
Albany, Ga.	330	273	225
Chicago, Ill.	383	367	363
Los Angeles, Cal.	710	783	802
New York, N. Y.	423	330	358

Although Table 10 shows average freight costs for shipments of peanut brittle, it does not reflect the total cost of transportation to the processors. Total transportation cost consists of cost of shipments of shelled peanuts to processors as well as the cost of peanut brittle shipment. Freight bills were calculated for the national market and for the eastern market on two plant sizes to provide a basis for transportation costs comparison. The freight bills for the southeastern markets were not calculated because annual market size at 3,177,000 pounds was considered too small for the proposed plants, which would produce 3 million and 6 million pounds per year. The smaller plant would have had to achieve a 95 percent penetration of the southeastern market.

The eastern market for peanut brittle was estimated at 10,282,000 pounds in 1979. A peanut brittle processor, producing 3,040,000 pounds annually, would have to capture close to 30 percent of this market. The freight advantage an Albany peanut brittle processor would have in the eastern market is shown in Table 11. Albany shows a freight advantage over Chicago, New York, and Los Angeles based on the assumption that shelled peanut shipments to each processor are from the growing area with lowest transportation costs to the processor.

The national market for peanut brittle was estimated at 16,000,000 pounds in 1979. A peanut brittle processor, producing 3 million pounds annually, would have to capture 18.7 percent of this market, and a 6-million-pound plant would have to corner 37.5 percent. A 37.5 percent penetration of the peanut brittle market by a new firm is unlikely. Table 12 shows, on the basis of 6,080,000-pound annual shipments, Albany would offer a substantial freight advantage

Table 11. Comparative freight bills for peanut brittle centers, shipping 3,040,000 pounds yearly to the eastern market, 1981.

Processing Center	Freight Rates		Freight Bills			Freight Advantage for Albany Processor
	Shelled Peanut[a/]	Peanut Brittle[b/]	Shelled Peanut[c/]	Peanut Brittle[d/]	Total	
	Cents Per Hundredweight		Dollars			
Albany, Ga.	55	273	$ 6,435	$ 104,400	$ 111,835	
Chicago, Ill.	186	367	21,762	141,691	163,453	$ 51,618
Los Angeles, Cal.	275	783	32,175	302,301	334,476	222,641
New York, N. Y.	254	330	29,718	127,406	157,124	45,289

[a/] Freight rates based on 30,000-pound truckload or 70,000-pound minimum carload shipments.

[b/] See Table 10.

[c/] Calculation based on 1,170,000 pounds of shelled peanuts times .94 to obtain 1.1 million pounds of usable shelled peanuts.

[d/] Calculation based on net product weight of 3,040,000 pounds times 1.27 to obtain 3,865,880 pounds shipping weight.

Table 12. Comparative freight bills for peanut brittle centers, shipping 6,080,000 pounds yearly to the national market, 1981.

Processing Center	Freight Rates		Freight Bills			Freight Advantage for Albany Processor
	Shelled Peanut[a/]	Peanut Brittle[b/]	Shelled Peanut[c/]	Peanut Brittle[d/]	Total	
	Cents Per Hundredweight		Dollars			
Albany, Ga.	55	330	$ 12,870	$ 254,813	$ 267,683	
Chicago, Ill.	186	380	43,524	293,342	336,866	$ 69,183
Los Angeles, Cal.	275	710	64,350	548,234	612,584	344,901
New York, N. Y.	254	423	59,436	326,624	386,060	118,377

a/ Freight rates based on 30,000-pound truckload or 70,000-pound minimum carload shipments.

b/ See Table 10.

c/ Calculation based on 2,340,000 pounds of shelled peanuts times .94 to obtain 2.2 million pounds of usable shelled peanuts.

d/ Calculation based on net product weight of 6,080,000 pounds times 1.27 to obtain 7,721,600 pounds of shipping weight.

over Los Angeles and New York, and a slight advantage over Chicago.

Freight Cost Evaluation -- The preceding analysis has attempted only to view transportation costs. It is important, however, to consider transportation costs in relation to other plant costs. How important are transportation costs as compared with other plant costs? Interviews with peanut brittle processors revealed that, depending upon the size of the market served, the operating basis of the carrier utilized (common carrier, contract, or company-owned), and the mode of transportation (rail or motor carrier), the finished product transportation cost was approximately 4 percent to 6 percent of total production costs.

Utilizing estimated annual cost data for the two plant sizes, serving the national market and the eastern market, the total cost of transportation was compared with relevant costs and total costs of plant operations for processors located at Albany, Chicago, and New York (see Table 13). Total transportation costs for the three locations, serving the national market, range from 5.1 to 6.4 percent of total plant costs. However, looking at relevant costs, that is, those costs which vary from location to location such as labor, utilities, transportation, general expenses, and other miscellaneous variables (in other words, all costs except materials cost and sales expenses), the costs of transportation for plants serving the national market vary from 18.7 to 20.4 percent of relevant costs. For serving the eastern market, the percentages vary from 13.2 to 14.8 percent of relevant costs.

Table 13. Total transportation costs as a percentage of total costs and relevant costs for selected peanut brittl processing centers, 1981.

Market and Processing Centers	Total Transportation Costs[a]	Total Plant Costs[b]	Relevant Plant Costs[c]	Transportation Cost as a Percentage of Total Costs	Transportation Cost as a Percentage of Relevant Costs
Eastern					
Albany	$ 111,835	$ 2,753,882	$ 789,281	4.1	14.2
New York	157,124	3,198,799	1,186,676	4.9	13.2
Chicago	163,453	3,110,584	1,101,505	5.3	14.8
National					
Albany	$ 267,683	$ 5,244,438	$ 1,325,236	5.1	20.4
New York	386,060	6,021,998	1,997,752	6.4	19.3
Chicago	336,866	5,818,703	1,800,545	5.8	18.7

[a] See previous tables.

[b] Costs calculated in the comparative plant and operating cost analysis.

[c] Relevant costs are those which, as opposed to constant costs, vary from location to location.

TRANSPORTATION ANALYSIS FOR SALTED PEANUTS

In order to determine the possible advantages or disadvantages of a processor located in Albany, Ga., a study of transportation economics in the salted peanut industry was conducted.

Major salted peanut processing areas were identified in order to compare their transportation costs with those of an Albany plant. An analysis of the existing market structure revealed a concentration of salted peanut processors in the Virginia-North Carolina-South Carolina-Tennessee region. Other regions where salted peanut processing was concentrated were the Northeast and Midwest. Those points chosen for comparison with Albany were Chicago, Los Angeles, New York, and Suffolk.

Rail rates were used for movements over 349 miles and motor-carrier rates for those under that distance. Albany, Los Angeles, and Suffolk had established commodity rate structures for the rail transportation of salted peanuts.

A number of factors, other than freight rates, affect the selection of the appropriate size of shipment for a route. The size of the market, the processor's warehousing system, and the practice of product rotation at the retail level all would affect the size of shipment and, therefore, the freight cost.

For the purpose of this analysis, commodity rates for rail movement of salted peanuts were based on minimum carloads of 60,000 pounds, 90,000 pounds, or 120,000 pounds, depending on demand routes, and, for motor-carrier shipment, minimum truckloads of 30,000 pounds. The shipment of shelled peanuts by rail was based on 30,000 pounds.

Comparative Freight Bill Analysis

A comparative analysis of the transportation costs of salted peanut processing centers was conducted, using actual commodity rates plus fuel surcharges for each supply-demand route of salted peanuts and shelled peanuts. Thirty cents per hundredweight was added to railroad rate for local transportation. (see Appendices 12-16.)

It was assumed that salted peanut processors follow the practice of quoting prices on a freight-allowed basis, since a number of companies use this pricing policy. This policy allows the processor to price his product on a uniform delivered basis to all buyers in a particular market without regard to the distance of product shipment. To determine this uniform price, an amount must be added to the processor's f.o.b. price which would cover the processor's total cost of salted peanuts transportation. An average freight cost was calculated for each of the processing centers, based on service to the national, eastern, and southeastern markets (see Table 14).

Table 14. Average freight costs from salted peanut processing centers.

Processing Center	National Market	Eastern Market	Southeastern Market
	(Cents Per Hundredweight)		
Albany, Ga.	234	196	166
Chicago, Ill.	308	291	325
Los Angeles, Cal.	439	481	453
New York, N. Y.	325	204	212
Suffolk, Va.	310	232	235

Although Table 14 shows the average freight costs for shipments of salted peanuts, it does not reflect the total cost of transportation to processors. Total transportation costs consist of the cost of shelled peanuts shipments to the processors as well as the cost of the salted peanut shipments. Freight bills have been calculated for the eastern and national markets in order to provide a basis for comparing transportation costs.

Southeastern market demand was estimated at 48,768,000 pounds annually in 1979. It was assumed this market was served by either a regional salted peanut processor with a yearly output of 8 million pounds or a national processor whose shipments to the southeastern market are 8 million pounds. The processor would have about a 16.4 percent share of the southeastern market.

The freight bills for the five processors, based on this assumption of a 8-million-pound share of the southeastern market, are shown in Table 15. The table shows that an Albany location for a salted peanut processor serving the southeastern market, offers a transportation advantage over points chosen for comparison. For example, a Chicago processor selling 8 million pounds of its salted peanuts in the southeastern market could save $271,085 in transportation costs by opening a facility in Albany.

Eastern market demand was estimated at 169,857,000 pounds of salted peanuts in 1979. It was assumed this market was served by either a regional salted peanut processor with a yearly output of 8 million pounds or a national processor whose shipments to the eastern market are 16 million pounds. The processor would have about a 9.4 percent share of the eastern market.

The freight bills for the five processors, based on this assumption of a 16-million-pound share of the eastern market, are shown in Table 16. The table shows the freight advantages of an Albany location for a salted peanut processor serving the eastern market over those points chosen for comparison. The advantages range from $946,470 over a Los Angeles location to $72,000 over a Suffolk location.

The national market for salted peanuts was estimated at 265,770,000 pounds for 1979. It was assumed that the yearly production of a national salted peanut processor would be 16 million pounds, which would represent a national market penetration of about 6 percent. Table 17 shows that an Albany plant with shelled peanut shipments from the Southeast would have a freight advantage over Chicago, Los Angeles, New York, and Suffolk. An Albany salted peanut processor would have a small competitive edge over Suffolk, located in the region that leads the national market in salted peanuts production.

Table 15. Comparative freight bills for salted peanut centers, shipping 8 million pounds yearly to the southeastern market, 1981.

Processing Center	Freight Rates		Freight Bills			Freight Advantage for Albany Processor
	Shelled Peanut[a/]	Salted Peanut[b/]	Shelled Peanut[c/]	Salted Peanut[d/]	Total	
	Cents Per Hundredweight		Dollars			
Albany, Ga.	55	166	$ 47,059	$ 166,000	$ 213,059	
Chicago, Ill.	186	325	159,144	325,000	484,144	$ 271,085
Los Angeles, Cal.	275	453	235,294	453,000	688,294	475,235
New York, N. Y.	252	212	215,615	212,000	427,615	214,556
Suffolk, Va.	55	235	47,059	235,000	282,059	69,000

a/ Freight rates based on 30,000-pound minimum truckload or carload of 120,000, 90,000, or 60,000 pounds depending on locations.

b/ See Table 14.

c/ Calculation based on 8,556,150 pounds of shelled peanuts times .935 to obtain 8 million pounds product weight.

d/ Calculation based on net product weight of 8 million pounds time 1.25 to obtain 10 million pounds shipping weight.

Table 16. Comparative freight bills for salted peanut centers, shipping 16 million pounds yearly to the eastern market, 1981.

Processing Center	Freight Rates		Freight Bills			Freight Advantage for Albany Processor
	Shelled Peanut[a]	Salted Peanut[b]	Shelled Peanut[c]	Salted Peanut[d]	Total	
	Cents Per Hundredweight		Dollars			
Albany, Ga.	55	196	$ 94,118	$ 392,000	$ 486,118	
Chicago, Ill.	186	291	318,289	582,000	900,289	$ 414,171
Los Angeles, Cal.	275	481	470,588	962,000	1,432,588	946,470
New York, N. Y.	252	204	431,230	408,000	839,230	353,112
Suffolk, Va.	55	232	94,118	464,000	558,118	72,000

[a] Freight rates based on 30,000-pound minimum truckload or carload of 120,000, 90,000, or 60,000 pounds depending on locations.

[b] See Table 14.

[c] Calculation based on 17,112,300 pounds of shelled peanuts times .935 to obtain 16 million pounds product weight.

[d] Calculation based on net product weight of 16 million pounds times 1.25 to obtain 20 million pounds shipping weight.

Table 17. Comparative freight bills for salted peanut centers, shipping 16 million pounds yearly to the national market, 1981.

Processing Center	Freight Rates		Freight Bills			Freight advantage for Albany Processor
	Shelled Peanut[a]	Salted Peanut[b]	Shelled Peanut[c]	Salted Peanut[d]	Total	
	Cents Per Hundredweight		Dollars			
Albany, Ga.	55	234	$ 94,118	$ 468,000	$ 562,118	
Chicago, Ill.	186	308	318,289	616,000	934,289	$ 372,171
Los Angeles, Cal.	275	439	470,588	878,000	1,348,588	786,470
New York, N. Y.	252	325	431,230	650,000	1,081,230	519,112
Suffolk, Va.	55	310	94,118	620,000	714,118	152,000

[a] Freight rates based on 30,000-pound minimum truckload or carload of 120,000, 90,000 or 60,000 pounds depending on locations.

[b] See Table 14.

[c] Calculation based on 17,112,300 pounds of shelled peanuts times .935 to obtain 16 million pounds product weight.

[d] Calculation based on net product weight of 16 million pounds times 1.25 to obtain 20 million pounds shipping weight.

Freight Cost Evaluation -- The preceding analysis has only considered transportation costs. It is important, however, to consider the significance of transportation costs in relation to other plant costs. Interviews with salted peanut processors revealed that, depending upon the size of the market served, the operating basis of the carrier utilized (common carrier, contract, or company-owned), and the mode of transportation, the transportation cost was approximately 3 to 4 percent of total production costs.

Utilizing estimated annual cost data for plants serving the southeastern, eastern and national markets, the total cost of transportation as compared with relevant costs and total costs of plant operations was estimated for processors located at Albany and Suffolk (see Table 18). Total transportation costs for the two locations, serving the southeastern market, range from 2.2 to 2.8 percent. For the eastern market, they range from 2.5 to 2.8 percent. For the national market, they range from 2.9 to 3.6 percent. However, looking at relevant costs, that is, those costs which vary from location to location, such as labor, utilities, transportation, general expenses, and other miscellaneous variables (in other words, all costs except materials cost and sales expenses), the costs of transportation for plants serving the southeastern market vary from 20.2 to 23.8 percent; those processors serving the eastern market vary from 24.9 to 26.2 percent; and those for processors serving the national market range from 27.7 to 31.3 percent.

Table 18. Total transportation costs as a percentage of total costs and relevant costs for selected salted peanut processing centers.

Market and Processing Centers	Total Transportation Costs[a/]	Total Plant Costs[b/]	Relevant Plant Costs[c/]	Transportation Cost as a Percentage of Total Costs	Transportation Cost as a Percentage of Relevant Costs
Southeastern					
Albany	$ 213,059	$ 9,822,324	$ 1,057,561	2.2	20.2
Suffolk	282,059	10,036,802	1,186,477	2.8	23.8
Eastern					
Albany	$ 486,118	19,482,668	1,953,141	2.5	24.9
Suffolk	558,118	19,829,114	2,128,464	2.8	26.2
National					
Albany	562,118	19,482,668	2,029,141	2.9	27.7
Suffolk	714,118	19,829,114	2,284,464	3.6	31.3

[a/] See previous tables.

[b/] Costs calculated in the comparative plant and operating cost analysis.

[c/] Relevant costs are those which, as opposed to constant costs, vary from location to location.

TRANSPORTATION ANALYSIS FOR PEANUT OIL

In order to determine the possible advantages or disadvantages of a processor located in the Georgia producing area, a study of transportation economics in the peanut oil industry was conducted.

Those areas in the nation where crushing peanuts for peanut oil is concentrated were identified in order to compare their transportation costs with those of an Albany plant. Analyzing the existing market structure revealed a concentration of crushers in the southeastern region. This region accounted for over 70 percent of the nation's peanuts crushed for oil in recent years. The remaining percentage was about equally divided between the Virginia-Carolina and southwestern growing regions. Those points chosen for comparison with Albany were the Fort Worth, Texas, and Portsmouth Virginia areas.

Rail rates were used in comparing transportation costs from the three peanut oil crushing centers to the market destinations. Albany, Fort Worth, and Portsmouth have established commodity rate structures for rail transportation for peanut oil. (see Appendices 17-19.) The shipments were in tank cars with a minimum weight of 150,000 pounds.

Using actual commodity rates plus fuel surcharges for each supply-demand route of peanut oil, a comparative analysis of transportation costs for the three peanut oil crushing centers was conducted. The average freight cost for shipping peanut oil to the national market was calculated. It was found that the average cost per hundredweight was as follows: Albany, $2.00; Fort Worth, $3.35; and Portsmouth, $2.78. For shipments to the eastern market, the average cost per hundredweight was as follows: Albany, $1.59; Fort Worth, $3.13; and Portsmouth, $1.70. For shipments to the southeastern market, the average cost per hundredweight was as follows: Albany, $1.25; Fort Worth, $2.92; and Portsmouth, $1.57.

Obviously, Albany has a comfortable advantage in transportation cost over Fort Worth for peanut oil shipments. It also has a relative advantage over Portsmouth. These transportation cost differences are presented in Table 19.

Table 19. Peanut oil average freight costs from processing centers.

Processing Center	National Market	Eastern Market	Southeastern Market
	(Cents Per Hundredweight)		
Albany, Ga.	200	159	125
Fort Worth, Tex.	335	313	292
Portsmouth, Va.	278	170	157

APPENDICES

Appendix 1. Peanut butter transportation rates from Albany, Georgia, to the market regions, 1981.

Market Destination	Railroad Rates (Minimum Weights in Pounds)			
	80,000		120,000	
	(Cents Per Hundredweight)			
Southeast	A	B	A	B
Charleston, W. Va.			137	170
Charlotte, N. C.			89	121
Knoxville, Tenn.			79	111
Miami, Fla.			108	140
Nashville, Tenn.			101	133
Norfolk, Va.			142	175
Richmond, Va.			142	175
Non-Southeast				
Baltimore, Md.	211	246		
Boston, Mass.	273	309		
Chicago, Ill.	200	237		
Dallas, Tex.	191	227		
Denver, Colo.	290	330		
Detroit, Mich.	231	266		
Kansas City, Mo.	216	253		
Los Angeles, Cal.	423	467		
Minneapolis, Minn.	252	290		
New York, N. Y.	236	271		
Philadelphia, Pa.	231	266		
Seattle, Wash.	423	467		

	Motor Carrier Rates (Minimum Weights in Pounds)	
	30,000	
Southeast	A	B
Atlanta, Ga.	131	135
Birmingham, Ala.	165	170
Chattanooga, Tenn.	185	191
Columbia, S. C.	185	191
Jacksonville, Fla.	131	135
Mobile, Ala.	187	193
Tampa, Fla.	185	191

A = Basic rate.
B = Railroad basic rate plus fuel surcharge, 2.2% or 3.4%, depending on destination, plus 30 cents per hundredweight for local transportation. Motor carrier basic rate plus 3.3% fuel surcharge on truckload weight.

Sources: Railroad Basic Rates -- Southern Railway System.
Motor Carrier Basic Rates -- Roadway Express, Inc., and Overnite Transportation.

Appendix 2. Peanut butter transportation rates from Chicago, Illinois, to the market regions, 1981.

Market Destination	Railroad Rates (Minimum Weight in 120,000 Pounds) (Cents Per Hundredweight)	
	A	B
Southeast		
Atlanta, Ga.	145	180
Birmingham, Ala.	132	166
Charleston, W. Va.	141	174
Charlotte, N. C.	155	190
Chattanooga, Tenn.	121	155
Columbia, S. C.	155	190
Jacksonville, Fla.	193	230
Knoxville, Tenn.	117	151
Miami, Fla.	240	278
Mobile, Ala.	155	190
Nashville, Tenn.	91	124
Norfolk, Va.	244	279
Richmond, Va.	221	256
Tampa, Fla.	205	242
Non-Southeast		
Baltimore, Md.	211	246
Boston, Mass.	249	284
Dallas, Tex.	219	256
Denver, Colo.	227	265
Kansas City, Mo.	128	162
Los Angeles, Cal.	370	412
Minneapolis, Minn.	116	149
New York, N. Y.	232	267
Philadelphia, Pa.	221	256
Seattle, Wash.	370	412

Non-Southeast	Motor Carrier Rates (Minimum Weight in 30,000 Pounds) A	B
Chicago, Ill.	30	30
Detroit, Mich.	174	180

A = Basic rate.
B = Railroad basic rate plus fuel surcharge, 2.2% or 3.4%, depending on destination, plus 30 cents per hundredweight for local transportation. Motor carrier basic rate plus 3.3% fuel surcharge on truckload weight.

Sources: Railroad Basic Rates -- Southern Railway System.
Motor Carrier Basic Rates -- Roadway Express, Inc., and Overnite Transportation.

Appendix 3. Peanut butter transportation rates from Cincinnati, Ohio, to the market regions, 1981.

Market Destination	Railroad Rates (Minimum Weight in 120,000 Pounds) (Cents Per Hundredweight)	
	A	B
Southeast		
Atlanta, Ga.	111	143
Birmingham, Ala.	111	143
Charlotte, N. C.	121	154
Columbia, S. C.	121	154
Jacksonville, Fla.	160	194
Miami, Fla.	206	240
Mobile, Ala.	150	183
Norfolk, Va.	185	219
Richmond, Va.	166	200
Tampa, Fla.	150	183
Non-Southeast		
Baltimore, Md.	164	198
Boston, Mas.	232	267
Dallas, Tex.	242	280
Denver, Colo.	284	324
Kansas City, Mo.	175	211
Los Angeles, Cal.	446	491
Minneapolis, Minn.	194	231
New York, N. Y.	194	228
Philadelphia, Pa.	185	219
Seattle, Wash.	446	491
	Motor Carrier Rates (Minimum Weight in 30,000 Pounds)	
Southeast	A	B
Charleston, W. Va.	187	193
Chattanooga, Tenn.	180	186
Knoxville, Tenn.	180	186
Nashville, Tenn.	203	210
Non-Southeast		
Chicago, Ill.	194	200
Detroit, Mich.	172	178

A = Basic rate.
B = Railroad basic rate plus fuel surcharge, 2.2% or 3.4%, depending on destination, plus 30 cents per hundredweight for local transportation. Motor carrier basic rate plus 3.3% fuel surcharge on truckload weight.

Sources: Railroad Basic Rates -- Southern Railway System.
Motor Carrier Basic Rates -- Roadway Express, Inc., and Overnite Transportation.

Appendix 4. Peanut butter transportation rates from Cincinnati, Ohio, to the market regions, 1981.

Market Destination	Railroad Rates (Minimum Weight in 120,000 Pounds) (Cents Per Hundredweight)	
	A	B
Southeast		
Atlanta, Ga.	171	207
Birmingham, Ala.	143	178
Charleston, W. Va.	273	312
Charlotte, N. C.	209	246
Chattanooga, Tenn.	162	197
Columbia, S. C.	206	243
Jacksonville, Fla.	197	234
Knoxville, Tenn.	182	218
Miami, Fla.	253	292
Mobile, Ala.	135	170
Nashville, Tenn.	150	185
Norfolk, Va.	322	363
Richmond, Va.	309	349
Tampa, Fla.	216	253
Non-Southeast		
Baltimore, Md.	336	377
Boston, Mass.	406	450
Chicago, Ill.	219	256
Denver, Colo.	201	247
Detroit, Mich.	273	312
Kansas City, Mo.	148	183
Los Angeles, Cal.	342	384
Minneapolis, Minn.	222	260
New York, N. Y.	378	421
Philadelphia, Pa.	368	410
Seattle, Wash.	342	384

	Motor Carrier Rates (Minimum Weight in 30,000 Pounds)	
Non-Southeast	A	B
Dallas, Tex.	30	30

A = Basic rate.
B = Railroad basic rate plus fuel surcharge, 2.2% or 3.4%, depending on destination, plus 30 cents per hundredweight for local transportation. Motor carrier basic rate plus 3.3% fuel surcharge on truckload weight.

Sources: Railroad Basic Rates -- Southern Railway System.
Motor Carrier Basic Rates -- Roadway Express, Inc., and Overnite Transportation.

Appendix 5. Peanut butter transportation rates from Los Angeles, California, to the market regions, 1981.

Market Destination	Railroad Rates (Minimum Weight in 100,000 Pounds) (Cents Per Hundredweight)	
Southeast	A	B
Atlanta, Ga.	422	466
Birmingham, Ala.	399	443
Charleston, W. Va.	471	517
Charlotte, N. C.	422	466
Chattanooga, Tenn.	399	443
Columbia, S. C.	422	466
Jacksonville, Fla.	422	466
Knoxville, Tenn.	422	466
Miami, Fla.	422	466
Mobile, Ala.	399	443
Nashville, Tenn.	399	443
Norfolk, Va.	471	517
Richmond, Va.	471	517
Tampa, Fla.	422	466
Non-Southeast		
Baltimore, Md.	471	517
Boston, Mass.	420	464
Chicago, Ill.	369	412
Dallas, Tex.	342	384
Denver, Colo.	272	311
Detroit, Mich.	442	487
Kansas City, Mo.	342	384
Minneapolis, Minn.	345	386
New York, N. Y.	471	517
Philadelphia, Pa.	471	517
Seattle, Wash.	272	311

	Motor Carrier Rates (Minimum Weight in 30,000 Pounds)	
Non-Southeast	A	B
Los Angeles, Cal.	30	30

A = Basic rate.
B = Railroad basic rate plus fuel surcharge, 2.2% or 3.4%, depending on destination, plus 30 cents per hundredweight for local transportation. Motor carrier basic rate plus 3.3% fuel surcharge on truckload weight.

Sources: Railroad Basic Rates -- Southern Railway System.
Motor Carrier Basic Rates -- Roadway Express, Inc., and Overnite Transportation.

Appendix 6. Peanut butter transportation rates from New York, N. Y., to the market regions, 1981.

Market Destination	Railroad Rates (Minimum Weight in 120,000 Pounds) (Cents Per Hundredweight)	
	A	B
Southeast		
Atlanta, Ga.	165	199
Birmingham, Ala.	186	220
Charleston, W. Va.	171	207
Charlotte, N. C.	126	159
Chattanooga, Tenn.	162	196
Columbia, S. C.	149	182
Jacksonville, Fla.	184	218
Knoxville, Tenn.	150	183
Miami, Fla.	226	261
Mobile, Ala.	216	251
Nashville, Tenn.	186	210
Norfolk, Va.	112	144
Tampa, Fla.	207	242
Non-Southeast		
Chicago, Ill.	232	267
Dallas, Tex.	371	414
Denver, Col.	410	454
Detroit, Mich.	174	208
Kansas City, Mo.	289	329
Los Angeles, Cal.	471	517
Minneapolis, Minn.	277	316
Seattle, Wash.	471	517
	Motor Carrier Rates (Minimum Weight in 30,000 Pounds)	
Southeast	A	B
Richmond, Va.	228	236
Non-Southeast		
Baltimore, Md.	190	196
Boston, Mass.	188	194
New York, N. Y.	30	30
Philadelphia, Pa.	153	158

A = Basic rate.
B = Railroad basic rate plus fuel surcharge, 2.2% or 3.4%, depending on destination, plus 30 cents per hundredweight for local transportation. Motor carrier basic rate plus 3.3% fuel surcharge on truckload weight.

Sources: Railroad Basic Rates -- Southern Railway System.
Motor Carrier Basic Rates -- Roadway Express, Inc., and Overnite Transportation.

Appendix 7. Peanut butter transportation rates from Suffolk, Va. to the market regions, 1981.

Market Destination	Railroad Rates (Minimum Weight in 120,000 Pounds) (Cents Per Hundredweight)	
	A	B
Southeast		
Atlanta, Ga.	121	154
Birmingham, Ala.	150	183
Charleston, W. Va.	133	166
Chattanooga, Tenn.	126	159
Jacksonville, Fla.	125	158
Knoxville, Tenn.	116	149
Miami, Fla.	177	211
Mobile, Ala.	177	211
Nashville, Tenn.	155	188
Tampa, Fla.	160	194
Non-Southeast		
Boston, Mass.	170	204
Chicago, Ill.	232	267
Dallas, Tex.	309	349
Denver, Col.	404	447
Detroit, Mich.	214	249
Kansas City, Mo.	285	314
Los Angeles, Cal.	471	516
Minneapolis, Minn.	289	319
New York, N. Y.	116	149
Seattle, Wash.	471	516

	Motor Carrier Rates (Minimum Weight in 30,000 Pounds)	
	A	B
Southeast		
Charlotte, N. C.	185	191
Columbia, S. C.	212	219
Norfolk, Va.	48	54
Richmond, Va.	60	68
Non-Southeast		
Baltimore, Md.	102	105
Philadelphia, Pa.	93	96

A = Basic rate.
B = Railroad basic rate plus fuel surcharge, 2.2% or 3.4%, depending on destination, plus 30 cents per hundredweight for local transportation. Motor carrier basic rate plus 3.3% fuel surcharge on truckload weight.

Sources: Railroad Basic Rates -- Southern Railway System.
Motor Carrier Basic Rates -- Roadway Express, Inc., and Overnite Transportation.

Appendix 8. Peanut brittle transportation rates from Albany, Ga., to the market regions, 1981.

Market Destination	Railroad Rates (Minimum Weight in 60,000 Pounds) (Cents Per Hundredweight)	
	A	B
Southeast		
Charleston, W. Va.	275	311
Charlotte, N. C.	205	240
Knoxville, Tenn.	189	223
Miami, Fla.	228	263
Nashville, Tenn.	207	241
Norfolk, Va.	261	297
Richmond, Va.	261	297
Non-Southeast		
Baltimore, Md.	318	355
Boston, Mass.	399	438
Chicago, Ill.	350	392
Dallas, Tex.	315	355
Denver, Col.	445	490
Detroit, Mich.	335	372
Kansas City, Mo.	341	378
Los Angeles, Cal.	677	729
Minneapolis, Minn.	392	435
New York, N. Y.	350	388
Philadelphia, Pa.	335	372
Seattle, Wash.	677	729

	Motor Carrier Rates (Minimum Weight in 30,000 Pounds)	
Southeast	A	B
Atlanta, Ga.	153	158
Birmingham, Ala.	174	180
Chattanooga, Tenn.	187	193
Columbia, S. C.	187	193
Jacksonville, Fla.	153	158
Mobile, Ala.	191	197
Tampa, Fla.	187	193

A = Basic rate.
B = Railroad basic rate plus fuel surcharge, 2.2% or 3.4%, depending on destination, plus 30 cents per hundredweight for local transportation. Motor carrier basic rate plus 3.3% fuel surcharge on truckload weight.

Sources: Railroad Basic Rates -- Southern Railway System.
Motor Carrier Basic Rates -- Roadway Express, Inc., and Overnite Transportation.

Appendix 9. Peanut brittle transportation rates from Chicago, Ill., to the market regions, 1981.

Market Destination	Railroad Rates (Minimum Weights in Pounds)			
	50,000		60,000	
	(Cents Per Hundredweight)			
Southeast	A	B	A	B
Atlanta, Ga.			275	314
Birmingham, Ala.			259	298
Charleston, W. Va.	336	373		
Charlotte, N. C.			296	336
Chattanooga, Tenn.			248	286
Columbia, S. C.			291	331
Jacksonville, Fla.			341	382
Knoxville, Tenn.			230	268
Miami, Fla.			411	486
Mobile, Ala.			269	308
Nashville, Tenn.			209	308
Norfolk, Va.	497	538		
Richmond, Va.	465	505		
Tampa, Fla.	372	415		
Non-Southeast				
Baltimore, Md.	456	496		
Boston, Mass.	470	510		
Dallas, Tex.			448	493
Denver, Col.			362	404
Kansas City, Mo.			291	331
Los Angeles, Cal.			494	541
Minneapolis, Minn.			265	304
New York, N. Y.	490	531		
Philadelphia, Pa.	465	505		
Seattle, Wash.			494	541

	Motor Carrier Rates (Minimum Weight in Pounds)	
	30,000	
Non-Southeast	A	B
Chicago, Ill.	30	30
Detroit, Mich.	174	180

A = Basic rate.
B = Railroad basic rate plus fuel surcharge, 2.2% or 3.4%, depending on destination, plus 30 cents per hundredweight for local transportation. Motor carrier basic rate plus 3.3% fuel surcharge on truckload weight.

Sources: Railroad Basic Rates -- Southern Railway System.
Motor Carrier Basic Rates -- Roadway Express, Inc., and Overnite Transportation.

Appendix 10. Peanut brittle transportation rates from Los Angeles, California, to the market region, 1981.

Market Destination	Railroad Rates (Minimum Weight in 60,000 Pounds) (Cents Per Hundredweight)	
	A	B
Southeast		
Atlanta, Ga.	711	762
Birmingham, Ala.	711	762
Charleston, W. Va.	877	932
Charlotte, N. C.	711	762
Chattanooga, Tenn.	711	762
Columbia, S. C.	711	762
Jacksonville, Fla.	711	762
Knoxville, Tenn.	711	762
Miami, Fla.	762	814
Mobile, Ala.	711	762
Nashville, Tenn.	711	762
Norfolk, Va.	877	902
Richmond, Va.	877	902
Tampa, Fla.	762	814
Non-Southeast		
Baltimore, Md.	711	762
Boston, Mass.	711	762
Chicago, Ill.	590	637
Dallas, Tex.	533	578
Denver, Col.	388	429
Detroit, Mich.	711	762
Kansas City, Mo.	533	578
Minneapolis, Minn.	711	762
New York, N. Y.	711	762
Philadelphia, Pa.	711	762
Seattle, Wash.	388	429

	Motor Carrier Rates (Minimum Weight in 30,000 Pounds)	
Non-Southeast	A	B
Los Angeles, Cal.	30	30

A = Basic rate.
B = Railroad basic rate plus fuel surcharge, 2.2% or 3.4%, depending on destination, plus 30 cents per hundredweight for local transportation. Motor carrier basic rate plus 3.3% fuel surcharge on truckload weight.

Sources: Railroad Basic Rates -- Family Lines System.
Motor Carrier Basic Rates -- Roadway Express, Inc., and Overnite Transportation.

Appendix 11. Peanut brittle transportation rates from New York, N. Y. to the market regions, 1981.

Market Destination	Railroad Rates (Minimum Weights in pounds)			
	50,000		60,000	
	(Cents Per Hundredweight)			
Southeast	A	B	A	B
Atlanta, Ga.			313	350
Birmingham, Ala.			342	380
Charleston, W. Va.	390	429		
Charlotte, N. C.			260	296
Chattanooga, Tenn.			308	345
Columbia, S. C.			279	315
Jacksonville, Fla.			335	372
Knoxville, Tenn.			228	263
Miami, Fla.			403	442
Mobile, Ala.			384	422
Nashville, Tenn.			342	380
Norfolk, Va.	296	332		
Tampa, Fla.			374	412
Non-Southeast				
Chicago, Ill.	490	531		
Dallas, Tex.			679	724
Denver, Col.			690	735
Detroit, Mich.	395	434		
Kansas City, Mo.			534	576
Los Angeles, Cal.			861	910
Minneapolis, Minn.			515	556
Seattle, Wash.			861	910

	Motor Carrier Rates (Minimum Weight in 30,000 Pounds)	
Southeast	A	B
Richmond, Va.	261	270
Non-Southeast		
Baltimore, Md.	212	219
Boston, Mass.	188	194
New York, N. Y.	30	30
Philadelphia, Pa.	174	180

A = Basic rate.
B = Railroad basic rate plus fuel surcharge, 2.2% or 3.4%, depending on destination, plus 30 cents per hundredweight for local transportation. Motor carrier basic rate plus 3.3% fuel surcharge on truckload weight.

Sources: Railroad Basic Rates -- Southern Railway System.
Motor Carrier Basic Rates -- Roadway Express, Inc., and Overnite Transportation.

Appendix 12. Salted peanut transportation rates from Albany, Ga., to the market regions, 1981.

Market Destination	Railroad Rates (Minimum Weight in 120,000 Pounds)	
	(Cents Per Hundredweight)	
Southeast	A	B
Charleston, W. Va.	150	183
Charlotte, N. C.	89	121
Knoxville, Tenn.	79	111
Miami, Fla.	119	152
Nashville, Tenn.	101	133
Norfolk, Va.	142	175
Richmond, Va.	142	175
Non-Southeast		
Baltimore, Md.	211	246
Boston, Mass.	273	309
Chicago, Ill.	200	237
Dallas, Tex.	315	356
Denver, Col.	292	332
Detroit, Mich.	234	269
Kansas City, Mo.	218	255
Los Angeles, Cal.	423	467
Minneapolis, Minn.	254	293
New York, N. Y.	236	271
Philadelphia, Pa.	231	266
Seattle, Wash.	423	467
	Motor Carrier Rates (Minimum Weight in 30,000 Pounds)	
Southeast	A	B
Atlanta, Ga.	153	158
Birmingham, Ala.	174	180
Chattanooga, Tenn.	187	193
Columbia, S. C.	187	193
Jacksonville, Fla.	153	158
Mobile, Ala.	191	197
Tampa, Fla.	187	193

A = Basic rate.

B = Railroad basic rate plus fuel surcharge, 2.2% or 3.4%, depending on destination, plus 30 cents per hundredweight for local transportation. Motor carrier basic rate plus 3.3% fuel surcharge on truckload weight.

Sources: Railroad Basic Rates -- Southern Railway System.
Motor Carrier Basic Rates -- Roadway Express, Inc., and Overnite Transportation.

Appendix 13. Salted peanut transportation rates from Chicago, Ill., to the market region, 1981.

Market Destination	Railroad Rates (Minimum Weight 60,000 Pounds) (Cents Per Hundredweight)	
	A	B
Southeast		
Atlanta, Ga.	280	320
Birmingham, Ala.	264	303
Charleston, W. Va.	143	176
Charlotte, N. C.	301	341
Chattanooga, Tenn.	253	292
Columbia, S. C.	301	341
Jacksonville, Fla.	348	390
Knoxville, Tenn.	240	278
Miami, Fla.	416	460
Mobile, Ala.	301	341
Nashville, Tenn.	309	350
Norfolk, Va.	246	281
Richmond, Va.	223	261
Tampa, Fla.	372	415
Non-Southeast		
Baltimore, Md.	213	248
Boston, Mass.	252	288
Dallas, Tex.	231	269
Denver, Col.	209	246
Kansas City, Mo.	154	189
Los Angeles, Cal.	630	681
Minneapolis, Minn.	231	269
New York, N. Y.	234	269
Philadelphia, Pa.	223	258
Seattle, Wash.	494	541

Non-Southeast	Motor Carrier Rates (Minimum Weight in 30,000 Pounds)	
	A	B
Chicago, Ill.	30	30
Detroit, Mich.	174	180

A = Basic rate.
B = Railroad basic rate plus fuel surcharge, 2.2% or 3.4%, depending on destination, plus 30 cents per hundredweight for local transportation. Motor carrier basic rate plus 3.3% fuel surcharge on truckload weight.

Sources: Railroad Basic Rates -- Southern Railway System.
Motor Carrier Basic Rates -- Roadway Express, Inc., and Overnite Transportation.

Appendix 14. Salted peanut transportation rates from Los Angeles, Cal., to the market region, 1981.

Market Destination	Railroad Rates (Minimum Weight in 90,000 Pounds)	
	(Cents Per Hundredweight)	
Southeast	A	B
Atlanta, Ga.	369	412
Birmingham, Ala.	347	389
Charleston, W. Va.	484	530
Charlotte, N. C.	390	433
Chattanooga, Tenn.	347	389
Columbia, S. C.	390	433
Jacksonville, Fla.	390	433
Knoxville, Tenn.	369	412
Miami, Fla.	434	479
Mobile, Ala.	347	389
Nashville, Tenn.	347	389
Norfolk, Va.	541	589
Richmond, Va.	541	589
Tampa, Fla.	434	479
Non-Southeast		
Baltimore, Md.	541	589
Boston, Mass.	567	616
Chicago, Ill.	380	423
Dallas, Tex.	360	402
Denver, Col.	258	297
Detroit, Mich.	420	464
Kansas City, Mo.	314	355
Minneapolis, Minn.	314	355
New York, N. Y.	541	589
Philadelphia, Pa.	541	589
Seattle, Wash.	330	371

Non-Southeast	Motor Carrier Rates (Minimum Weight in 30,000 Pounds)	
	A	B
Los Angeles, Cal.	30	30

A = Basic rate.
B = Railroad basic rate plus fuel surcharge, 2.2% or 3.4%, depending on destination, plus 30 cents per hundredweight for local transportation. Motor carrier basic rate plus 3.3% fuel surcharge on truckload weight.

Sources: Railroad Basic Rates -- Southern Railway System.
Motor Carrier Basic Rates -- Roadway Express, Inc., and Overnite Transportation.

Appendix 15. Salted peanut transportation rates from New York, N. Y., to the market region, 1981.

Market Destination	Railroad Rates (Minimum Weight in 120,000 Pounds)	
	(Cents Per Hundredweight)	
Southeast	A	B
Atlanta, Ga.	166	200
Birmingham, Ala.	187	221
Charleston, W. Va.	173	207
Charlotte, N. C.	127	160
Chattanooga, Tenn.	163	197
Columbia, S. C.	150	183
Jacksonville, Fla.	185	219
Knoxville, Tenn.	151	184
Miami, Fla.	232	267
Mobile, Ala.	218	253
Nashville, Tenn.	187	221
Norfolk, Va.	113	145
Tampa, Fla.	209	244
Non-Southeast		
Chicago, Ill.	234	272
Dallas, Tex.	394	437
Denver, Col.	683	736
Detroit, Mich.	175	209
Kansas City, Mo.	528	576
Los Angeles, Cal.	1092	1159
Minneapolis, Minn.	509	556
Seattle, Wash.	861	910
	Motor Carrier Rates (Minimum Weight in 30,000 Pounds)	
Southeast	A	B
Richmond, Va.	261	270
Non-Southeast		
Baltimore, Md.	212	219
Boston, Mass.	188	194
New York, N. Y.	30	30
Philadelphia, Pa.	174	180

A = Basic rate.
B = Railroad basic rate plus fuel surcharge, 2.2% or 3.4%, depending on destination, plus 30 cents per hundredweight for local transportation. Motor carrier basic rate plus 3.3% fuel surcharge on truckload weight.

Sources: Railroad Basic Rates -- Southern Railway System.
Motor Carrier Basic Rates -- Roadway Express, Inc., and Overnite Transportation.

Appendix 16. Salted peanut transportation rates from Suffolk, Va., to the market region, 1981.

Market Destination	Railroad Rates (Minimum Weight in 60,000 Pounds) (Cents Per Hundredweight)	
	A	B
Southeast		
Atlanta, Ga.	218	253
Birmingham, Ala.	253	289
Charleston, W. Va.	181	215
Chattanooga, Tenn.	228	263
Jacksonville, Fla.	223	258
Knoxville, Tenn.	202	236
Miami, Fla.	292	328
Mobile, Ala.	292	328
Nashville, Tenn.	257	293
Tampa, Fla.	265	301
Non-Southeast		
Boston, Mass.	229	264
Chicago, Ill.	313	354
Dallas, Tex.	585	635
Denver, Col.	604	655
Detroit, Mich.	289	325
Kansas City, Mo.	461	507
Los Angeles, Cal.	513	560
Minneapolis, Minn.	475	521
New York, N. Y.	161	195
Seattle, Wash.	513	560

	Motor Carrier Rates (Minimum Weight in 30,000 Pounds)	
	A	B
Southeast		
Charlotte, N. C.	185	191
Columbia, S. C.	212	219
Norfolk, Va.	48	54
Richmond, Va.	60	68
Non-Southeast		
Baltimore, Md.	102	105
Philadelphia, Pa.	93	96

A = Basic rate.
B = Railroad basic rate plus fuel surcharge, 2.2% or 3.4%, depending on destination, plus 30 cents per hundredweight for local transportation. Motor carrier basic rate plus 3.3% fuel surcharge on truckload weight.

Sources: Railroad Basic Rates -- Family Lines System.
Motor Carrier Basic Rates -- Roadway Express, Inc., and Overnite Transportation.

Appendix 17. Peanut oil railroad commodity rates from Albany, Georgia, to the market region, 1981.

Market Destination	Carload (Minimum Weight in 150,000 Pounds)	
	(Cents Per Hundredweight)	
Southeast	A	B
Atlanta, Ga.	67	98
Birmingham, Ala.	71	103
Charleston, W. Va.	141	174
Charlotte, N. C.	86	118
Chattanooga, Tenn.	80	112
Columbia, S. C.	80	112
Jacksonville, Fla.	67	98
Knoxville, Tenn.	85	117
Miami, Fla.	114	147
Mobile, Ala.	81	113
Nashville, Tenn.	99	131
Norfolk, Va.	127	160
Richmond, Va.	127	160
Tampa, Fla.	80	112
Non-Southeast		
Baltimore, Md.	186	220
Boston, Mass.	245	280
Chicago, Ill.	201	235
Dallas, Tex.	216	251
Denver, Col.	285	321
Detroit, Mich.	194	228
Kansas City, Mo.	213	248
Los Angeles, Cal.	415	454
Minneapolis, Minn.	250	286
New York, N. Y.	201	235
Philadelphia, Pa.	194	228
Seattle, Wash.	415	454

A = Basic rate.
B = Railroad basic rate plus fuel surcharge, 2.2% or 3.4%, depending on destination, plus 30 cents per hundredweight for local transportation.

Source: Southern Railway System.

Appendix 18. Peanut oil railroad commodity rates from Fort Worth, Texas, to the market region by tank-car shipments, 1981.

Market Destination	Carload (Minimum Weight in 150,000 Pounds)	
	(Cents Per Hundredweight)	
Southeast	A	B
Atlanta, Ga.	239	277
Birmingham, Ala.	180	216
Charleston, W. Va.	250	289
Charlotte, N. C.	286	326
Chattanooga, Tenn.	226	264
Columbia, S. C.	286	326
Jacksonville, Fla.	279	318
Knoxville, Tenn.	250	289
Miami, Fla.	290	330
Mobile, Ala.	175	211
Nashville, Tenn.	173	209
Norfolk, Va.	323	364
Richmond, Va.	315	356
Tampa, Fla.	271	310
Non-Southeast		
Baltimore, Md.	327	368
Boston, Mass.	377	420
Chicago, Ill.	277	316
Dallas, Tex.	80	80
Denver, Col.	238	276
Detroit, Mich.	259	298
Kansas, Mo.	169	205
Los Angeles, Cal.	610	661
Minneapolis, Minn.	293	333
New York, N. Y.	347	389
Philadelphia, Pa.	342	384
Seattle, Wash.	831	889

A = Basic rate.
B = Railroad basic rate plus fuel surcharge, 2.2% or 3.4%, depending on destination, plus 30 cents per hundredweight for local transportation.

Source: Southern Railway System.

Appendix 19. Peanut oil railroad commodity rates from Portsmouth, Virginia, to the market region by tank-car shipments, 1981.

Market Destination	Carload (Minimum Weight in 150,000 Pounds)	
	(Cents Per Hundredweight)	
Southeast	A	B
Atlanta, Ga.	120	153
Birmingham, Ala.	143	176
Charleston, W. Va.	153	186
Charlotte, N. C.	80	112
Chattanooga, Tenn.	124	157
Columbia, S. C.	83	115
Jacksonville, Fla.	122	155
Knoxville, Tenn.	105	137
Miami, Fla.	189	223
Mobile, Ala.	183	217
Nashville, Tenn.	153	186
Norfolk, Va.	65	96
Richmond, Va.	80	112
Tampa, Fla.	144	177
Non-Southeast		
Baltimore, Md.	120	153
Boston, Mass.	170	204
Chicago, Ill.	230	265
Dallas, Tex.	361	403
Denver, Col.	601	651
Detroit, Mich.	206	241
Kansas City, Mo.	504	551
Los Angeles, Cal.	765	821
Minneapolis, Minn.	507	554
New York, N. Y.	144	177
Philadelphia, Pa.	120	153
Seattle, Wash.	807	864

A = Basic rate.
B = Railroad basic rate plus fuel surcharge, 2.2% or 3.4%, depending on destination, plus 30 cents per hundredweight for local transportation.

Source: Southern Railway System.

Project A-2806

Comparative Plant and Operating Cost Analysis For Updating the Study on Peanut Processing Opportunities

Prepared for
Southwest Georgia Planning and Development Commission
Post Office Box 346
Camilla, Georgia 31730

Submitted by
Economic Development Laboratory
Engineering Experiment Station
Georgia Institute of Technology

September 1981

Contents

	Page
METHODOLOGY FOR COMPARATIVE PLANT AND OPERATING COST ANALYSIS	1
COMPARATIVE PLANT AND OPERATING COST ANALYSIS FOR PEANUT BUTTER PROCESSING	4
COMPARATIVE PLANT AND OPERATING COST ANALYSIS FOR PEANUT BRITTLE PROCESSING	31
COMPARATIVE PLANT AND OPERATING COST ANALYSIS FOR SALTED PEANUTS PROCESSING	53
COMPARATIVE PLANT AND OPERATING COST ANALYSIS FOR PEANUT OIL PROCESSING	74
ACKNOWLEDGEMENTS	75
BIBLIOGRAPHY	77

METHODOLOGY FOR COMPARATIVE PLANT AND OPERATING COST ANALYSIS

This section of the study primarily concerns the production and marketing costs of peanut butter, salted peanuts, peanut brittle, and peanut oil. However, in many instances, the raw material supplies and the markets for and marketing of the finished products are involved in the investigation as well. Through an analysis of costs and returns, the relative importance of each factor at a given location can be revealed in dollars and cents. The three main areas of investigation in this section of the study are investment requirements, production costs, and potential returns. Detailed calculations are given for each product except peanut oil.

Investment requirements -- Manufacturing plant investment requirements comprise all physical outlays plus working capital. Physical outlays would involve land, building, machinery, equipment, and auxiliary items needed in a plant. Working capital refers to the cash necessary to run the plant.

Production costs -- Variable costs and fixed overhead or general expenses are the two main outlays under production costs. Variable costs consist of raw materials, containers, labor, utilities, and miscellaneous items. General expenses include administrative personnel, depreciation, interest, ad valorem taxes, insurance, and miscellaneous.

Potential returns -- A determination of the potential return on investment is the ultimate goal of a feasibility study; it provides the basis on which entrepreneurs make their decisions. To arrive at the potential return, additional information is necessary. The prices and pricing situation of the products involved must be studied, and sales expenses and tax conditions must be considered. Finally, returns on investments and payout periods are derived.

Procedures in Computation

In the process of computing the costs and returns of products, four sequential steps are taken: assumption of several basic conditions, determination of physical outlays, computation of production costs, and estimation of potential returns. These steps are briefly discussed below.

Assuming basic conditions -- Three basic conditions must be determined before steps can be taken to investigate detailed production costs of the products involved. They are: the location of the plant, plant size and operating period, and product quality and specifications. Plant location affects nearly all costs involved in production, notably land value, building costs, raw material costs, wage rates, utility rates, and local taxes. In this study, southwest Georgia was chosen to represent the southeastern peanut producing

area. Various cost data collected were based on Albany, Georgia, as the representative of southwest Georgia. The choice of other locations was based primarily on the distribution of existing processing centers for each peanut product covered in this study.

Plant size and operating period affect product volume, annual revenues, and capital expenditures of a given plant. These conditions are based on trade practices and the size of the market involved. Product quality and specifications have to be decided in order to ascertain trade outlets, unit prices, type of container used, and raw materials purchased. The choices are based on trade practices.

Deciding physical outlays -- Three main groups of physical outlays -- land and building, machinery, and auxiliary equipment used in a plant -- must be determined. The land should be developed, industrial land with access to highways, railroads, utilities, and sewage. The type of building and space adopted should conform to accepted trade practices. In the processing of peanut products, storage space invariably is several times larger than the space required for production. The choice of machinery is complex, depending upon the individual producer's need, the product volume involved, and the trend in machinery development. The choice here is based on the recommendation of major equipment suppliers.

Computing production costs -- Production costs involve raw materials, containers, labor, utilities, and overhead fixed expenses. The input-output ratio of all raw materials used for a given product is determined first. Annual volume is then fixed. The costs of raw materials would vary from one plant location to another. Labor requirements would be consistent with the machinery used. On the other hand, wage rates would reflect differences among locations and in job titles. Container costs are dependent upon size, kind, and shape and also reflect the market demand. Utility requirements are influenced by the machinery used and operating period assumed. Utility rates are collected from the different locations under study.

Overhead or general expenses are decided on the basis of established trade practices. General expenses include administrative personnel, depreciation, interest, ad valorem taxes, insurance, and miscellaneous.

Estimating returns -- Total revenues of a given plant are decided by the volume of product produced times unit price. Unit price is based on the current price of national brand names. In summarizing costs and returns, two final tables are given for each product except peanut oil. One table summarizes variable costs and general expenses, plus sales expenses. Sales expenses include cash discounts, brokerage fees, advertising and promotion, and freight-out costs on finished goods. Total costs involved in the production and marketing of a given product are summarized in the table.

The second table is designed to show potential returns on a given investment by subtracting all costs and expenses from total revenues in order to arrive at net income before taxes. Corporate taxes on the federal and state levels are deducted to arrive at net income. The net income is compared with total investment in order to arrive at the ratio of income to investment or to determine the payout period for the investment.

Sources of Information

Information for this cost study came largely from firsthand interviews with numerous producers of peanut products, equipment suppliers, engineering firms, container suppliers, brokers of peanut products and relevant raw material, and agencies dealing with utilities, land transactions, insurance, taxes, and building costs. Producers of peanut products constituted the backbone of the interviews and provided a wide range of data needed in this study. Equipment suppliers and engineering firms provided the bulk of information concerning required machinery and costs. The costs of raw materials used came largely from brokers of the respective materials. The prices of the final peanut products were obtained either from brokers or from the producers themselves. Membership lists supplied by associations and publications obtained from public agencies were most helpful in providing leads for further contacts.

COMPARATIVE PLANT AND OPERATING COST ANALYSIS FOR PEANUT BUTTER PROCESSING

Three plant locations -- southwest Georgia, Chicago, and Cincinnati -- were chosen for cost comparison.

In this cost study, plant size is expressed in terms of hourly output of peanut butter. Two plant sizes have been adopted -- 4,000 pounds per hour and 8,000 pounds per hour. Investment outlays and production costs vary according to the different plant sizes and will be detailed in the following sections.

The operating period used in this study consists of 250 working days a year and two 8-hour shifts per day or 4,000 working hours a year.

The U. S. Department of Agriculture has established three peanut butter grades -- U. S. Grade A, U. S. Grade C, and Substandard. These grades are ascertained by color, consistency, absence of defects, flavor, and aroma. peanut butter, according to trade sources, is composed of at least 90 percent peanuts. If the peanut content is below 90 percent, it is called imitation. Most peanut butter sold in the market is U. S. Grade A, with at least 90 percent peanut content; therefore, references to peanut butter in this study imply this grade.

Processing Procedures -- Peanut butter is made by grinding well-roasted and carefully blanched peanuts, usually with salt. The quality of the butter depends on the peanuts used and on the care and skill of the several manufacturing operations.

Many producers use Runners alone, or as part of a blend. Some use a mixture of Virginia and Spanish peanuts to secure a desirable proportion of oily constitutents. The desirable color, flavor, and consistency must be determined individually by each producer to suit the preferences of his trade. Several major steps in peanut butter making are described below:

Roasting -- The first and most important step is the roasting of shelled peanuts. This operation develops the flavor and color of peanut butter. The peanuts are dry roasted by one of two methods -- batch or continuous. Both methods have their merits, but continuous roasting is generally used in large plants.

Cooling -- Heat should be removed from the roasted peanuts as soon as possible to avoid further development of color and to prevent excessive liberation of oil. Roasted nuts are discharged directly to a cooler box with a perforated false bottom through which air can be pulled through the mass by a powerful suction fan.

Blanching -- Blanching is performed to remove the skins and hearts of peanut kernels. The equipment is a split-nut blancher. By

means of a rubbing action, the skins are removed and blown into a collector, kernels are split and hearts are taken out.

Cleaning and Color Sorting -- Before blanched peanuts can be ground into a satisfactory butter, it is necessary to remove foreign materials and imperfect kernels. This operation is done by a blower, a magnet, and electronic color sorting machines.

Grinding -- Peanut butter is usually made in two grinding operations. Roasted nuts are reduced into a medium grind, then to a fine, smooth texture. If more than one peanut variety is used, proper blending should take place before grinding. Additives such as sugar, hydrogenated vegetable oil, and stabilizers may be added through feeders in the process of grinding. To ensure complete and uniform assimilation of all additives into the peanut butter, the ingredients may be discharged into a mixing pump. From there the peanut butter goes to a filling machine.

Packaging -- In this study, it is assumed that the peanut butter produced is intended primarily for retail trade. Different-sized jars are filled by automatic machines.

Figure 1 shows a typical peanut butter processing system.

Investment Requirements

Two types of investment -- fixed investment and working capital -- are examined. Fixed investment requirements include land and building, processing equipment, and auxiliary equipment for operating, testing, and office uses. Itemized cost estimates on each requirement, given separately, based on two plant sizes and three locations are as follows:

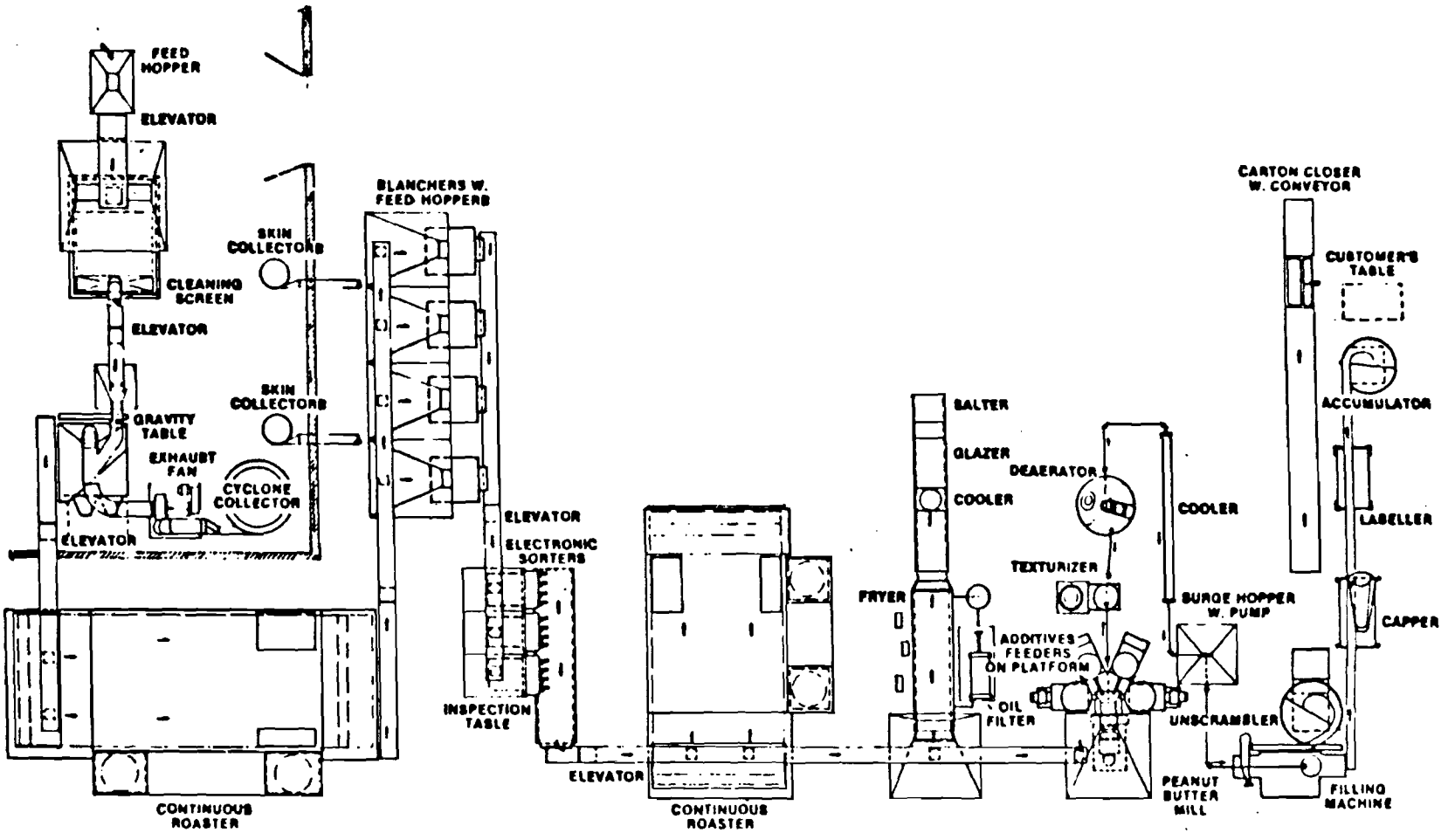
Land and Building -- Land requirements are estimated on the basis of four acres for a 4,000-pounds-per-hour plant and five acres for an 8,000-pounds-per-hour plant. Building space requirements are estimated at 35,000 square feet and 50,000 square feet respectively, for the given plant sizes (see Table 1).

Land costs are estimated at $13,000 per acre in southwest Georgia, $74,000 per acre in Chicago, and $40,000 per acre in Cincinnati. These costs were average 1981 prices supplied by a major title insurance company and were based on developed industrial lands.

Building costs are $20.00 per square foot for southwest Georgia, $27.62 per square foot for Chicago, and $27.94 per square foot for Cincinnati (Table 1). These costs are based on the "Dodge Building Cost Indexes For U. S. and Canadian cities," in which average costs in New York City are $29.63 per square foot for a brick-concrete plant building with a wall height of 20 feet and useful space of 10,000 square feet. The costs include structure and finish, heating, venti-

Figure 1. A typical peanut butter processing system

1) Cleaning Section



2) Roasting, Blending, Sorting **3) Dry Roasted Nuts** **4) Salted Nuts** **5) Peanut Butter** **6) Peanut Butter Packaging**

Courtesy Neumunz, Inc.

lation, plumbing, electricity, and site work. The index on New York is 100.

The cost estimates on land and plant building (Table 1) are based on the above data. Obviously, southwest Georgia has the lowest costs, with a saving of 126 percent over Chicago and 56 percent over Cincinnati.

Processing Equipment -- Two peanut butter processing models are used in this study. Both models are based on a continuous-type roaster. The first model is adopted for a plant with an output of 4,000 pounds per hour, and the second is adopted for 8,000 pounds per hour. Cost data for the 4,000 and 8,000-pounds-per-hour models are given in Table 2. Both plants use up-to-date machinery. No attempt is made here to describe the function of each piece of machinery listed. However, the combinations of machinery have been put together by one leading peanut butter equipment engineering firm.

Processing equipment may cost $596,500 for a 4,000-pounds-per-hour plant, and $956,900 for an 8,000-pounds-per-hour plant. Location has very little bearing on cost because transportation costs are an insignificant part of the total machinery costs.

Packaging Equipment -- Itemized machinery costs for the two given plant sizes are presented in Table 3. Generally the larger the plant, the more automatic machinery is needed. The automatic depallitizer and caser are not included in the 4,000-pounds-per-hour plant, but they are specified for the 8,000-pounds-per-hour plant. These machines, with attachments, can handle jar sizes of 6 ozs., 8 ozs., 12 ozs., 28 ozs., and 40 ozs.. The investment costs are $124,325 and $202,200 respectively, for the two plant sizes.

Auxiliary Equipment for Operating, Testing, and Office Uses -- Equipment under this category includes a forklift truck, battery, air compressor, boiler, pallets, belt conveyer, testing machinery, fire extinguishers, office machines, office furniture, and miscellaneous items. The total costs are estimated at $135,450 and $188,500 for the two plant sizes. Details are given in Table 4.

Working capital is another investment requirement associated with a plant. Requirements for working capital vary according to plant size and location. As a rule of thumb, working capital should be equivalent to two months' raw materials and one month's finished goods. Detailed estimates are given in Table 5.

Production Costs

Variable Costs

Two types of production costs -- variable and fixed -- are examined. Variable costs include raw materials, containers, labor,

utilities, and miscellaneous items. Raw materials used in the making of peanut butter are shelled peanuts and such additives as sugar, salt, and stabilizers. These costs, discussed separately below, include:

Shelled Peanuts -- It is assumed that the plants would have to buy shelled peanuts on the open market. Plant operators would buy in bulk in the summer and store the peanuts in the producing area. Commonly used peanut grades include Spanish No. 1, Spanish U. S. Splits, Runner No. 1 with Splits, Runner No. 1, and Runner Splits. The average price was 110 cents to 120 cents per pound in April 1981. The current prices for shelled peanuts are extremely high due to a serious drought and a poor harvest in all peanut growing regions in the United States last year. Peanut users have to import a large volume of shelled peanuts from foreign countries until a new crop from domestic sources is available in the market this fall. Peanut prices are expected to come down to 55-60 cents per pound this fall, if the new crop is harvested under normal weather conditions.

Peanut kernel shrinkage in processing may range from 6 percent to 12 percent and is due to the removal of moisture, skins, hearts, rejects, and foreign matter. A 10 percent shrinkage is assumed in this study. A typical shrinkage is given below:

Moisture	4 percent
Redskins	2 percent
Hearts	2 percent
Rejects	2 percent
Total	10 percent

Each pound of peanut butter would consist of 90 percent peanuts and 10 percent additives, by weight. Since the processing loss of peanut kernels is "made up" by additives, one pound of peanut kernels is required to make one pound of peanut butter. Annual shelled peanut requirements for the two plant sizes are 16 million and 32 million pounds (Table 6).

The shelled peanut prices adopted in this study are 55 cents in southwest Georgia and 57 cents in both Chicago and Cincinnati. The cost of shelled peanuts represents the single largest financial outlay in peanut butter processing, over 50 percent of the total cost.

Additives -- Additives used in the processing of peanut butter include sugar, salt, and stabilizers. The amount of additives used differs from one producer to another. In this study, a formula of 6.5 percent sugar, 1.5 percent salt, and 2.0 percent stabilizers is adopted. The sugar used is a mixture of corn syrup solids and is mostly dextrose. Salt is added to improve the flavor, and stabilizers such as hydrogenated vegetable oil, glycerin, lecithin, or antioxidants are used to prevent oil separation and to control rancidity. The cost of sugar or corn dextrose is higher in the North (30 cents

per pound) than in the Southeast (27 cents per pound). Salt and stabilizer costs are about the same over the eastern part of the United States, at 6 cents per pound and 50 cents per pound, respectively. The amounts of additives required are given in Table 6, and their costs are estimated in the same table.

Containers -- It is assumed that the peanut butter produced in this study is intended primarily for retail trade in the domestic market. Wide-mouthed glass jars are commonly used in this outlet. Jar sizes vary to a great extent, and the demand for the various jar sizes in the market would determine the volume of packs produced. The jar sizes adopted in this study are based on information developed from trade sources. Table 7 shows the number of cases required under each output volume.

Packaging costs per case, which include jars, cartons, caps, and labels, are given for each size jar and case in Table 7. The costs of the packaging materials, as given by major companies, are about the same over the eastern part of the United States. A few suppliers sell on base prices plus freight costs. Since the major suppliers have plants strategically located in different places, the differences in freight costs is negligible. Annual costs of these materials are presented in the table.

Wage rates used in calculating labor costs were based on a survey of peanut processing plants and wage rates published by government sources. Fringe benefits of 15 percent above given wage rates are added. Annual labor cost savings at the southwest Georgia are signficant -- 67 percent compared with Chicago and 55 percent over Cincinnati. Labor costs are detailed in Table 8. Total labor costs for the 8,000-pounds-per-hour plant were only $270,710 at a southwest Georgia location compared to $406,525 in Chicago and $490,360 in Cincinnati.

Utilities -- Power, gas, and water are included. Electricity requirements are broken down by operating and lighting purposes. Volume requirements for the two plant sizes are given in Table 9. Horsepower (HP) is converted to 30-minute integrated kilowatt (KW) demand. The operation is based on 16 hours per day, 21 days per month, and 12 months a year. Electricity needed for lighting is based on two watts per square foot of the estimated plant spaces mentioned in previous sections and is based on 24 hours a day. The requirements for power are split almost evenly between operating and lighting purposes.

Costs of electricity have increased significantly in the past year. For the consumption volume given in Table 9, power rates are 3.7 to 4.8 cents per kilowatt-hour (KWH) in southwest Georgia, 4.5 to 5.3 cents per KWH in Chicago, and 3.5 to 4.2 cents per KWH in Cincinnati, depending volume consumed. Annual power costs for the three locations are estimated in the table.

Gas is required for both processing and heating purposes, and the rates for the two purposes are different. It is estimated that 34,800 British thermal units (BTU) would be required to produce 100 pounds of peanut butter per hour. On this basis, the volume of gas required for processing each month is estimated in Table 10. Gas rates were obtained from gas companies in the different locations. Annual costs of gas for processing purposes are given in Table 10.

Gas requirements for heating purposes normally would be 7 BTU's per cubic foot in a brick building. However, the heat generated for processing purposes would remain partially in the building and thus would reduce the volume needed for heating. As a rule of thumb, 4 BTU's per cubic foot would be required for heating the plant building.

Differences in climate from place to place must be taken into account. The degree-day, a unit that represents one degree below 65 degrees in the mean daily outdoor temperature, is used to indicate the relative coldness of a given location. Albany has about 1,900 degree days a year, Chicago registers about 3.16 times as cold as Albany, and Cincinnati is about 2.32 times as cold as Albany. Based on these assumptions, the estimated gas requirements for the different plant sizes are given in Table 10. Annual costs of gas for heating purposes are given in the same table.

Miscellaneous -- Miscellaneous expenses associated with variable costs may include such items as glue, ink, paper, and tape. They are estimated roughly at 1 percent of the total variable costs.

Fixed Costs

General expenses or overhead costs may include administrative personnel, depreciation on building and equipment, interest, ad valorem taxes, insurance, and miscellaneous.

Administrative Personnel -- A 8,000-pounds-per-hour plant would be large enough to afford a plant manager and a sales manager. In a 4,000-pounds-per-hour plant, the plant manager would handle sales jobs as well. Detailed personnel requirements are listed in Table 11, and annual salary costs are shown in the same table. There are some differentials in pay scale between southwest Georgia and the two northern cities. A 20 percent cost above salary is added to cover fringe benefits such as retirement plan, personnel insurance, paid holidays, and vacations.

Depreciation -- Depreciation schedules vary with individual companies. In this study, the standards used are 20 years on the building, 12 years on processing and packaging machinery, and 7 years on auxiliary equipment. The variations in the depreciation expenses in southwest Georgia, Chicago, and Cincinnati are presented in Table 12.

Interest -- Interest is based on the total fixed capital invest-

ment plus working capital. Borrowed capital for fixed investment may be paid out in a number of years and depends upon profit situations and the company's policy. Annual interest rate is assumed at 15 percent. The interest for working capital is assumed for only six months, because after this period of operation, the cash generated from sales should be able to take care of working capital. Annual interest expenses are presented in Table 13, by plant size and by location.

Ad Valorem Taxes -- The ad valorem tax rates for southwest Georgia, Chicago, and Cincinnati are given below:

Southwest Georgia:	Assessment: 40 percent of real market value Rate: $21.47 per $1,000 assessed value
Chicago, Illinois:	Assessment: 40 percent of real market value Rate: $9.819 per $100 assessed value
Cincinnati, Ohio:	Assessment: 35 percent of real value on property Rate: $50.50 per $1,000 assessed value

Based on these rates, Table 14 shows the annual ad valorem taxes for the two plant sizes in each of the three locations. These calculations indicate that southwest Georgia has the lowest property tax.

Insurance -- Insurance costs vary according to the type of plant construction and fire protection in the plant, location, and other factors. Only a rough estimate can be made without knowing the specific conditions for a given plant. The rates for fire and other extended risks coverage in southwest Georgia are 16 cents per hundred dollars on building, machinery, and equipment, and about 24 cents per hundred dollars on such contents as raw materials and finished goods. The rates in Chicago are 15 cents per hundred dollars on building, machinery and equipment, and 20 cents per hundred dollars on raw materials and finished goods. The rates in Cincinnati are 14.6 cents per hundred dollars on building, machinery and equipment, and at the same rate on raw materials and finished goods. It is assumed that a two weeks' supply, or less, of raw materials and finished goods would be stored in the plants at any time. The detailed calculations are given in Table 15.

Miscellaneous -- Miscellaneous expenses such as office supplies, telephone, telegraph, parts and maintenance, association dues, and others are estimated roughly at 7 percent of the total general expenses.

Potential Returns

Three national brands of peanut butter -- Skippy, Peter Pan, and Jif -- account for over 50 percent of sales in the United States. Their prices are competitive with slight variations throughout the

nation. However, many smaller manufacturers sell at prices which are generally lower than those of the national brand names. With limited distribution and smaller sales expenses, these small producers can afford to sell at lower prices. Current peanut butter prices are very high because of the small supply of shelled peanuts due to last year's drought. The prices of peanut butter are expected to be reduced when the supplies of shelled peanuts return to normal this fall. Table 16 shows the current delivered peanut butter prices of a national brand name by container sizes and the projected prices when the supplies of shelled peanuts are normal. The prices are given on per-case basis by container size in ounces. The projected prices are adopted for the calculation of potential returns in this study. The prices given in the table are delivered prices on a per-case basis.

Based on the projected wholesale prices mentioned previously, an average price of 1.3874 per pound has been derived by weighting the sales volume as follows:

6-ozs. size	5 percent
12-ozs. size	20 percent
18-ozs. size	50 percent
28-ozs. size	25 percent
40-ozs. size	10 percent

The average price per pound also is based on the prices for shipment volumes of 20,000 pounds to 39,999 pounds. The per-pound price calculation is given in Table 16. Based on the average price of 1.3874 per pound, gross sales revenues would be $22,198,400 for a 4,000-pounds-per-hour plant, and $44,396,000 for an 8,000-pounds-per-hour plant.

Sales expenses include cash discounts, brokerage fees, advertising and promotion, and cost of freight-out (shipments of finished goods). Cash discounts are generally given at 2 percent of the sales price if an order is paid within a 10-day period subsequent to delivery. It is assumed that half of the annual sales volume will carry this cash discount. Brokerage fees would amount to about 5 percent of the gross revenues since the national brands make extensive use of brokers throughout the nation in selling their products. Advertising and promotional expenses are assumed at 5 percent of gross sales.

Freight-out costs are estimated for packaged peanut butter on a per-hundredweight basis and are calculated separately for three sizes of markets -- national, eastern and regional. These costs have been presented in the transportation analysis. In southwest Georgia, the costs are $2.25 for national distribution, $1.91 for distribution in the eastern market, and $1.59 for distribution in the southeastern market. The per-hundredweight freight-out costs in Chicago are $2.20 for the national market, $2.03 for the eastern market, and $2.00 for the southeastern market, while the respective costs in Cincinnati are $2.27, $1.44, and $1.85.

Based on these per-hundredweight freight-out rates, detailed costs on a per-case basis were derived, and total freight-out costs were estimated. For a 4,000-pound-per-hour plant, annual shipments of 16 million pounds were made on the basis to the eastern market. For an 8,000-pounds-per-hour plant, annual shipments of 32 million pounds were made on the basis to the national market. In the market demand analysis, the national demand for peanut butter was 597 million pounds in 1979, 379 million pounds in the eastern market, and 117 million pounds in the southeastern market. Consequently, a 32-million-pounds-per-year plant would have to sell its product nationally and a 16-million-pounds-per-year plant would require the eastern market to absorb its production. The total freight-out costs on the two plant size were derived on this basis.

Production costs and gross sales for the two plant models in the three locations are summarized in Table 17. Except for freight-out costs, the sales expenses are the same for the two given plant sizes and among the three given locations. Variable costs differ considerably among the three locations. Southwest Georgia has the lowest variable costs and general expenses (fixed costs). For a 8,000-pounds-per-hour plant, the combined savings in variable costs and general expenses in southwest Georgia would amount to over one million dollars annually. The details are given in Table 17.

Cost per pound also is given in the table. In southwest Georgia, the cost per pound is about $1.02, while about 4 to 5 cents should be added to this cost for Chicago and Cincinnati. The per-pound variable costs and general expenses decline as the plant size increases. However, this advantage is nearly offset by the increased freight-out costs.

A summary statement of estimated costs and profits for the two plant models is presented in Table 18. The table is divided into two sections -- income and profitability indicators. Under the income section, all expenses and taxes are deducted from the gross sales in order to arrive at net income. Federal corporate income taxes are 48 percent, while state taxes are 6 percent in Georgia, 6.85 percent in Illinois, and 8 percent in Ohio. For the two given plant sizes, after-taxes net income for a 4,000-per-hour plant in southwest Georgia is nearly $500,000 higher than the plant in Chicago or Cincinnati; for a 8,000-pounds-per-hour plant, the net income in southwest Georgia is nearly $700,000 higher than Chicago or Cincinnati.

Profit margin or net income as a percentage of gross sales is about 12 percent in southwest Georgia, while it is about 2 percent lower in Chicago and Cincinnati. The returns on total assets are 53 percent and 60 percent for the two model plants in southwest Georgia, compared to 14 to 17 percent lower in Chicago and Cincinnati. The payout period ranges from 1.8 to 1.6 years in southwest Georgia, 2.6 to 2.1 years in Chicago, and 2.4 to 2 years in Cincinnati. The details are presented in Table 18.

Table 1. Investment requirements on land and building for two given plant sizes and three locations for peanut butter processing, 1981.

	Plants Size in Pounds Per Hour	
	4,000	8,000
Space Estimates		
Land in Acres	4	5
Building space in square feet:		
Production	6,000	8,000
Storage	20,000	30,000
Office	1,500	2,000
Cold storage	7,500	10,000
Total	$ 35,000	$ 50,000
Cost Estimates		
Southwest Georgia:		
Land ($13,000 per acre)	52,000	65,000
Site Preparation	16,000	26,000
Building ($20.00 per square foot)	700,000	1,000,000
Total	$ 768,000	$ 1,091,000
Chicago, Illinois;		
Land ($174,000 per acres)	696,000	870,000
Site Preparation	70,000	114,000
Building ($27.62 per square foot)	966,700	1,381,000
Total	$ 1,732,700	$ 2,365,000
Cincinnati, Ohio:		
Land ($40,000 per acre)	160,000	200,000
Site Preparation	42,000	66,000
Building ($27.94 per square foot)	998,000	1,397,000
Total	$ 1,200,000	$ 1,663,000

Table 2. Peanut butter processing equipment and quoted f.o.b. costs, continuous type, based on hourly output of 4,000 pounds and 8,000 pounds, 1981.

Machinery	Cost Plant Size in Pounds Per Hour 4,000	8,000
Cleaning Section*		
Elevator/Conveyor	8,600	10,100
Cleaning Screen	6,400	7,500
Elevator/Conveyor	7,500	8,800
Gravity Table	11,250	20,500
Bag House Dust Collector	10,700	16,000
De-Stoner	1,550	2,900
Feed Hoppers	4,600	4,200
Subtotal	$ 50,600	$ 70,000
Roasting, Blanching, Sorting Section		
Elevator/Conveyor	9,100	10,700
Continuous Roaster	106,000	137,000
Elevator/Conveyor	10,200	12,000
Blanchers with Skin Collectors*	33,000	55,000
Elevator Conveyor*	9,800	11,500
Electronic Sorter with Dust Collector*	43,200	86,900
Inspection Table*	7,600	7,600
Elevator/Conveyor*	10,500	12,300
Special Feed Hoppers*	10,600	9,700
Belt Conveyor	2,600	5,200
Recycling Elevator/Conveyor	6,200	6,200
Subtotal	$ 248,800	$ 354,100
Peanut Butter Section		
Peanut Butter Mill	42,000	52,000
Fine Grinding Mill	32,100	65,000
Feed Pumps	8,200	10,000
Additives Feed System	15,200	75,200
Surge Tank with Pipes and Fittings	12,800	18,600
Scraped Surface Heat Exchanger	72,000	140,000
Chilling Unit	12,000	22,000
Subtotal	$ 194,300	$ 382,800
Additional Services		
Erection and Start-up Supervision	42,000	63,300
Starter, Wiring, Lighting, etc.	19,000	27,100
Spare Parts for 2 Years Operation	26,000	32,200
Estimated Freight**	15,800	27,400
Subtotal	$ 102,800	$ 150,000
Total	$ 596,500	$ 956,900

* Not required if processing blanched peanuts.
**Depending on plant location.

Source: Neumunz, Inc., Leonia, New Jersey 07605.

Table 3. Peanut butter packaging equipment and quoted f.o.b. costs, by given plant size, 1981.

Machinery	Plant Size in Pounds Per Hour			
	4,000		8,000	
	No.	Cost	No.	Cost
Custom Stainless Steel Disc Unscrambler with SS Tilt Table	1	$ 4,000	-	
Custom Table Top Conveyor	1	1,710	-	
Custom Automatic Depalletizer/Unscrambler	-		1	30,000
Custom Pneumatic Jar Cleaner	1	12,720	1	12,720
Custom Change Part Twisters	3	3,690	5	6,150
Custom Top Chain Conveyor	1	2,043	1	2,043
Filler	1	18,000	1	30,000
Resina Capper	1	25,375	1	33,000
Labeler with Attachments	1	32,000	1	38,000
Custom Bi-directional Accumulator	1	11,817	1	11,817
Caser	-		1	24,000
Custom Falp Closer	1	3,785	1	3,785
Custom Carton Tapper	1	5,685	1	5,685
Freight in		3,500		5,000
Total		$ 124,325		$ 202,200

Source: The Hoshall Company, Doraville, Georgia 30360

Table 4. Auxiliary equipment for operating, testing, and office uses in peanut butter plants and estimated costs, 1981.

	Plant Size in Pounds Per Hour			
	4,000		8,000	
	No.	Cost	No.	Cost
Electric Forklift	2	$ 36,000	3	$ 54,000
Battery and Changer	2	14,000	3	21,000
Air Compressor	1	2,500	1	3,000
Boiler	1	25,000	1	32,000
Pallets	450	2,250	900	4,500
Belt Conveyor	1	1,200	1	1,500
Laboratory Equipment		12,000		15,000
Fire Protection		15,000		20,000
Office Furniture		15,000		20,000
Office Machines		7,500		10,000
Miscellaneous		5,000		7,500
Total		$ 135,450		$ 188,500

Table 5. Working capital requirements for peanut butter processing, by location and by plant size, 1981.

Location	Plant Size in Pounds Per Hour	One Month Finished Goods	Two Months Raw Materials	Total
Southwest, Ga.	4,000	$ 1,850,000	$ 1,500,000	$3,350,000
	8,000	3,700,000	3,000,000	6,700,000
Chicago, Ill.	4,000	1,850,000	1,600,000	3,450,000
	8,000	3,700,000	3,200,000	6,900,000
Cincinnati, Ohio	4,000	1,850,000	1,600,000	3,450,000
	8,000	3,700,000	3,200,000	6,900,00

Table 6. Annual raw material requirements and estimated costs for peanut butter processing, by plant size and location, 1981.

(for a 4,000-pounds-per-hour plant)

	Raw Material Input in Pounds			Southwest Georgia		Chicago, Illinois		Cincinnati, Ohio	
	Per Hour	Per Day	Per Year	Unit Price	Annual Cost	Unit Price	Annual Cost	Unit Price	Annual Cost
Shelled Peanut	4,000	64,000	16,000,000	55 cents	$ 8,800,000	57 cents	$ 9,120,000	57 cents	$ 9,120,000
Sugar	260	4,160	1,040,000	27 cents	280,800	30 cents	312,000	30 cents	312,000
Salt	60	960	240,000	6 cents	14,400	6 cents	14,400	6 cents	14,400
Stabilizer	80	1,280	320,000	50 cents	160,000	50 cents	160,000	50 cents	160,000
Total					$ 9,255,200		$ 9,606,400		$ 9,606,400

(for an 8,000-pounds-per-hour plant)

	Raw Material Input in Pounds			Southwest Georgia		Chicago, Illinois		Cincinnati, Ohio	
	Per Hour	Per Day	Per Year	Unit Price	Annual Cost	Unit Price	Annual Cost	Unit Price	Annual Cost
Shelled Peanut	8,000	128,000	32,000,000	55 cents	$17,600,000	57 cents	$ 18,240,000	57 cents	$18,240,000
Sugar	520	8,320	2,080,000	27 cents	561,600	30 cents	624,000	30 cents	624,000
Salt	120	1,920	480,000	6 cents	28,800	6 cents	28,800	6 cents	28,800
Stabilizer	160	2,560	640,000	50 cents	320,000	50 cents	320,000	50 cents	320,000
Total					$18,510,400		$ 19,212,800		$19,212,800

Table 7. Annual peanut butter volume produced, cases required, and estimated packaging container costs by jar size.

Jar Size (ozs.)	No. of Packs Per Case	Net Peanut Butter Weight Per Case (pounds)	% of Production	Cost of Jars, Caps, Cartons, and Labels Per Case	4,000 Pounds-Per-Hour			8,000 Pounds-Per-Hour		
					Pounds	Number of Cases	Annual Cost	Pounds	Number of Cases	Annual Cost
40	8	20	10	$3.30	1,600,000	80,000	263,702	3,200,000	160,000	527,406
28	12	21	25	3.50	4,000,000	190,476	666,666	8,000,000	380,952	1,333,332
18	12	13.5	40	2.30	6,400,000	474,074	1,090,370	12,800,000	948,148	2,180,740
12	24	18	20	4.00	3,200,000	177,778	711,112	6,400,000	355,556	1,422,224
6	24	9	5	3.00	800,000	88,889	266,667	1,600,000	177,778	533,334
			100		16,000,000	1,011,217	$ 2,998,517	32,000,000	2,022,434	$ 5,997,036

Table 8. Labor requirements and estimated annual labor costs for peanut butter processing, by location and by plant size, 1981.

Job Classification	Number of Workers: Plant Size in Pounds/Hour 4,000	Number of Workers: Plant Size in Pounds/Hour 8,000	Southwest Georgia: Hourly Rate	Southwest Georgia: Annual Wage 4,000 lbs./hour	Southwest Georgia: Annual Wage 8,000 lbs./hour	Chicago, Illinois: Hourly Rate	Chicago, Illinois: Annual Wage 4,000 lbs./hour	Chicago, Illinois: Annual Wage 8,000 lbs./hour	Cincinnati, Ohio: Hourly Rate	Cincinnati, Ohio: Annual Wage 4,000 lbs./hour	Cincinnati, Ohio: Annual Wage 8,000 lbs./hour
Foreman	2	2	$ 6.50	$ 26,000	$ 26,000	$ 10.00	$ 40,000	$ 40,000	$ 12.00	$ 48,000	$ 48,000
Production Worker	4	4	5.00	40,000	40,000	7.50	60,000	60,000	9.00	72,000	72,000
Maintenance	2	2	6.50	26,000	26,000	9.75	39,000	39,000	11.80	47,200	47,200
Packaging	8	6	4.70	75,200	56,400	7.00	112,000	84,000	8.50	136,000	102,000
Receiving and Shipping	4	6	5.00	40,000	60,000	7.50	60,000	90,000	9.00	72,000	108,000
Cleanup and Odd Jobs	2	3	4.50	18,000	27,000	6.75	27,000	40,500	8.20	32,800	49,200
	22	23		$ 225,200	$ 235,400		$ 338,000	$ 353,500		$ 408,000	$ 426,400
Fringe Benefits, 15%				33,780	35,310		50,700	53,025		61,200	63,960
Total				$ 258,980	$ 270,710		$ 388,700	$ 406,525		$ 469,200	$ 490,360

*Based on two shifts per day and eight hours per shift.

Table 9. Power requirements and estimated cost for peanut butter plants, by plant size and location, 1981.

Plant Size in Pounds Per Hour	KWH Per Month			Estimated Annual Cost					
				Southwest Georgia		Chicago		Cincinnati	
	For Processing	For Lighting	Total	¢/KWH	Cost	¢/KWH	Cost	¢/KWH	Cost
4,000	30,000	38,000	68,000	4.8	$39,168	5.3	$43,248	4.2	$34,272
8,000	55,000	55,000	110,000	3.7	48,840	4.5	59,400	3.5	46,200

Table 10. Natural gas requirements and estimated cost for peanut butter plants, by plant size and location, 1981.

Plant Size in Pounds Per Hour	Southwest Georgia				
	Therms Per Year			Cost	
	For Processing	For Heating	Total	¢/Therm	Annual
4,000	60,000	11,000	71,000	35	$24,850
8,000	112,000	16,000	128,000	34	43,520

Plant Size in Pounds Per Hour	Chicago, Illinois				
	Therms Per Year			Cost	
	For Processing	For Heating	Total	¢/Therm	Annual
4,000	60,000	34,600	94,600	40	$37,840
8,000	112,000	50,560	162,560	39	63,398

Plant Size in Pounds Per Hour	Chicago, Illinois				
	Therms Per Year			Cost	
	For Processing	For Heating	Total	¢/Therm	Annual
4,000	60,000	25,400	85,400	40	$34,160
8,000	112,000	37,120	149,120	40	59,648

Table 11. Administrative personnel requirements and estimated salary costs for peanut butter plants, by plant size and location, 1981.

	4,000 Pounds Per Hour			8,000 Pounds Per Hour		
		Annual Cost			Annual Cost	
Personnel	Number	Southwest Georgia	Chicago & Cincinnati	Number	Southwest Georgia	Chicago & Cincinnati
Plant Manager	1	$ 25,000	$ 32,000	1	$ 30,000	$ 35,000
Sales Manager	-	-	-	1	22,000	25,000
Stenographer	1	10,000	13,000	2	20,000	26,000
Production Clerk	1	9,000	12,000	2	18,000	24,000
Bookkeeping	2	20,000	24,000	3	30,000	36,000
Billing Clerk	2	20,000	26,000	3	30,000	39,000
Subtotal		$ 84,000	$ 107,000		$ 150,000	$ 185,000
Fringe Benefits, 20%		16,800	21,400		30,000	37,000
Total		$ 100,800	$ 128,400		$ 180,000	$ 222,000

Table 12. Annual depreciation expenses on building and equipment, by plant size and location, 1981.

Item	Life (Year)	Southwest Georgia: 4,000 Pounds Per Hour Plant Value	Southwest Georgia: 4,000 Pounds Per Hour Plant Annual Depreciation	Southwest Georgia: 8,000 Pounds Per Hour Plant Value	Southwest Georgia: 8,000 Pounds Per Hour Plant Annual Depreciation
Building	20	700,000	$ 35,000	$ 1,000,000	$ 50,000
Machinery	12	720,825	60,069	1,159,100	96,592
Auxiliary Equipment	7	135,450	19,350	188,500	26,929
Total			$ 114,419		$ 173,521

Item	Life (Year)	Chicago, Illinois: 4,000 Pounds Per Hour Plant Value	Chicago, Illinois: 4,000 Pounds Per Hour Plant Annual Depreciation	Chicago, Illinois: 8,000 Pounds Per Hour Plant Value	Chicago, Illinois: 8,000 Pounds Per Hour Plant Annual Depreciation
Building	20	$966,700	$ 48,335	$ 1,381,000	$ 69,050
Machinery	12	720,825	60,069	1,159,100	96,592
Auxiliary Equipment	7	135,450	19,350	188,500	26,929
Total			$ 127,754		$ 192,571

Item	Life (Year)	Cincinnati, Ohio: 4,000 Pounds Per Hour Plant Value	Cincinnati, Ohio: 4,000 Pounds Per Hour Plant Annual Depreciation	Cincinnati, Ohio: 8,000 Pounds Per Hour Plant Value	Cincinnati, Ohio: 8,000 Pounds Per Hour Plant Annual Depreciation
Building	20	$998,000	$ 49,900	$ 1,397,000	$ 69,850
Machinery	12	720,825	60,069	1,159,100	96,592
Auxiliary Equipment	7	135,450	19,350	188,500	26,929
Total			$ 129,319		$ 193,371

Table 13. Annual interest expenses for peanut butter processing, by plant size and location, 1981.

	Principal			Annual Interest	
	Plant Size in Pounds Per Hour		Interest	Plant Size in Pounds Per Hour	
	4,000	8,000	Rate	4,000	8,000
Southwest Georgia					
Fixed Capital	$ 1,623,000	$ 2,439,000	15%	$ 243,450	$ 365,850
Working Capital	3,350,000	6,700,000	15%, 6 mos.	251,250	502,500
Total				$ 494,700	$ 868,350
Chicago, Ill.					
Fixed Capital	2,588,000	3,713,000	15%	388,200	556,950
Working Capital	3,450,000	6,900,000	15%, 6 mos.	258,750	517,500
Total				$ 646,950	$ 1,074,450
Cincinnati, Oh.					
Fixed Capital	2,055,000	3,011,000	15%	308,250	451,650
Working Capital	3,450,000	6,900,000	15%, 6 mos.	258,750	517,500
Total				$ 567,000	% 969,150

Table 14. Property value and annual ad valorem taxes by plant size and location (peanut butter), 1981.

Location	4,000 Pounds Per Hour			8,000 Pounds Per Hour		
	Actual Value	Assessed Value	Annual Tax	Actual Value	Assessed Value	Annual Tax
Southwest Ga.	$ 1,623,000	$ 649,200	$ 13,938	$ 2,439,000	$ 975,600	$ 20,946
Chicago, Ill.	2,588,000	1,035,200	101,646	3,713,000	1,485,200	145,832
Cincinnati, Oh.	2,055,000	719,250	36,322	3,011,000	1,053,850	53,219

Note: See text for assessment percentage and tax rates.

Table 15. Annual insurance costs for a peanut butter processing plant, by plant size and location, 1981.

	Plant Size in Pounds Per Hour	Plant, Building, Machinery, and Equipment		Raw Materials and Finished Goods		Total Insurance Costs
		Value	Insurance Costs	Value	Insurance Costs	
Southwest, Georgia						
	4,000	$ 1,555,000	$2,488	$ 1,200,000	$2,880	$5,368
	8,000	2,348,000	3,757	2,400,000	5,760	9,517
Chicago, Ill.						
	4,000	1,822,000	2,733	1,224,000	2,448	5,181
	8,000	2,729,000	4,094	2,448,000	4,896	8,990
Cincinnati, Oh.	4,000	1,853,000	2,705	1,224,000	1,787	4,492
	8,000	2,745,000	4,008	2,448,000	3,574	7,582

Note: See text for insurance rates.

Table 16. Average price per pound of peanut butter, based on a national brand, shipment of 20,000 to 39,999 pounds, 1981.

Case Size[1/]	Delivered Price Per Case		Peanut Butter Net Weight	Projected Price Per Pound	Percent of Total Sales	Weighted Total
	Current[2/]	Projected[3/]				
8/40	$31.38	$26.67	20 lbs.	$1.3337	10	$ 13.3370
12/28	33.20	28.22	21 lbs.	1.3438	25	33.5950
12/18	21.94	18.65	13.5 lbs.	1.3814	40	55.2560
24/12	30.01	25.51	18 lbs.	1.4171	20	28.3420
24/6	17.39	14.78	9 lbs.	1.6424	5	8.2120
						$138.7420

$138.742 ÷ 100 = 1.3874 per lbs.

1/ Number of jars per case and number of ozs. of peanut butter per jar.

2/ Current price is based on shelled peanut price at $1.0 to $1.1 per pound.

3/ Projected price is based on shelled peanut price at $.55 - $.60 per pound.

Table 17. Estimated annual costs and earnings of typical peanut butter plant, by plant size and location, 1981.

	Southwest Georgia		Chicago, Illinois		Cincinnati, Ohio	
	Size in Pounds Per Hour		Size in Pounds Per Hour		Size in Pounds Per Hour	
	4,000	8,000	4,000	8,000	4,000	8,000
Sales						
Volume (pounds)	16,000,000	32,000,000	16,000,000	32,000,000	16,000,000	32,000,000
Dollars	$ 22,198,400	$ 44,396,800	$ 22,198,400	$ 44,396,800	22,198,400	$ 44,396,000
Sales Expenses						
Cash Discount, 2% of 1/2 Sales	221,984	443,968	221,984	443,968	221,984	443,968
Brokerage Fees, 5%	1,109,920	2,219,840	1,109,920	2,219,840	1,109,920	2,219,840
Advertising and Promotion, 5%	1,109,920	2,219,840	1,109,920	2,219,840	1,109,920	2,219,840
Freight-out	519,520	1,224,000	552,160	1,196,800	527,680	1,234,880
Subtotal	$ 2,961,344	6,107,648	2,993,984	6,080,448	2,969,504	6,118,528
Variable Costs						
Raw Materials (Table 6)	9,255,200	18,510,400	9,606,400	19,212,800	9,606,400	19,212,800
Packaging Containers (Table 7)	2,998,517	5,997,036	2,998,517	5,997,036	2,998,517	5,997,036
Labor (Table 8)	258,980	270,710	388,700	406,525	469,200	469,360
Power (Table 9)	39,168	48,840	43,248	59,400	34,272	46,200
Natural Gas (Table 10)	24,850	43,520	37,840	63,398	34,160	59,648
Miscellaneous	127,000	251,000	132,000	260,000	133,000	261,000
Subtotal	12,703,715	25,121,506	13,206,705	25,999,159	13,275,549	26,046,044
Fixed Costs						
Administrative (Table 11)	100,800	180,000	128,400	220,000	128,400	220,000
Depreciation (Table 12)	114,419	173,521	127,754	192,571	129,319	193,371
Interest (Table 13)	494,700	868,350	646,950	1,074,450	567,000	969,150
Ad valorem Taxes (Table 14)	13,928	20,946	101,646	145,832	36,322	53,219
Insurance (Table 15)	5,368	9,577	5,181	8,990	4,492	7,582
Miscellaneous	50,000	85,000	70,000	113,000	60,000	99,000
Subtotal	$ 779,215	1,337,394	1,079,931	1,754,843	925,533	1,542,322
Total Costs	$ 16,164,274	32,566,548	17,280,620	33,834,450	17,170,586	33,706,894
Costs Per Pound (cents)						
Sales Expenses	18.51	19.09	18.71	19.00	18.56	19.12
Variable Costs	79.40	78.50	82.54	81.25	82.97	81.39
Fixed Costs	4.87	4.18	6.75	5.48	5.78	4.82
Total Costs	102.78	101.77	108.00	105.73	107.31	105.33

Table 18. Summary statement of estimated costs and profits of peanut butter plants, based on plant sizes and locations, 1981.

	Southwest Georgia		Chicago, Illinois		Cincinnati, Ohio	
	Size in Pounds Per Hour		Size in Pounds Per Hour		Size in Pounds Per Hour	
	4,000	8,000	4,000	8,000	4,000	8,000
Income						
Gross Sales	$ 22,198,400	$ 44,396,800	$ 22,198,400	$ 44,396,800	$ 22,198,400	$ 44,396,000
Variable Costs	12,703,715	25,121,506	13,206,705	25,999,159	13,275,549	26,046,044
Variable Profit	9,494,685	19,275,294	8,991,695	18,397,641	8,922,851	18,349,956
Sales Expenses	2,961,344	6,107,648	2,993,984	6,080,448	2,969,504	6,118,528
Out-of-pocket Fixed Costs	664,796	1,163,873	952,177	1,562,272	796,214	1,348,951
Cash Income	5,868,545	12,003,773	5,045,534	10,754,921	5,157,133	10,882,477
Depreciation	114,419	173,521	127,754	192,571	129,319	193,371
Net Income before Taxes	5,754,126	11,830,252	4,917,780	10,562,350	5,027,814	10,689,106
Federal Taxes, 48%	2,761,980	5,678,521	2,360,534	5,069,928	2,413,351	5,130,771
State Taxes *	345,248	709,815	336,868	723,521	402,225	855,128
Net Income	$ 2,646,898	$ 5,441,916	$ 2,220,378	$ 4,768,901	$ 2,212,238	$ 4,703,207
Profitability Indicators						
Profit Margin, %	11.92	12.26	10.00	10.74	9.97	10.59
Return on Total Assets, %	53.23	59.55	36.77	44.93	40.19	47.45
Payout Period, Years	1.8	1.6	2.6	2.1	2.4	2.0

*State corporate income taxes: Georgia 6%, Illinois 6.85%, and Ohio 8%.

COMPARATIVE PLANT AND OPERATING COST ANALYSIS FOR PEANUT BRITTLE PROCESSING

Three plant locations -- Chicago, New York, and southwest Georgia -- were selected for cost comparison. Southwest Georgia was selected to represent the southeastern peanut-producing region. The region has easy access to raw materials for candy making. The sources of raw materials for candy making in the southwest Georgia area are listed below:

Peanuts and pecans -- local
Refined sugar -- Savannah, Ga.
Fruit, nuts, and sugar -- South America through Panama City, Fla.
Pineapple and citrus fruits -- Florida

The Chicago and New York metropolitan areas were chosen for two reasons: they represent the largest peanut candy consuming area in the nation, and they have the largest concentration of peanut candy manufacturers.

Two plant sizes are used in this study -- an output of 1,520 pounds per hour and an output of 3,040 pounds per hour. The operating period is based on one 8-hour shift per day and 250 working days per year.

Processing Procedures

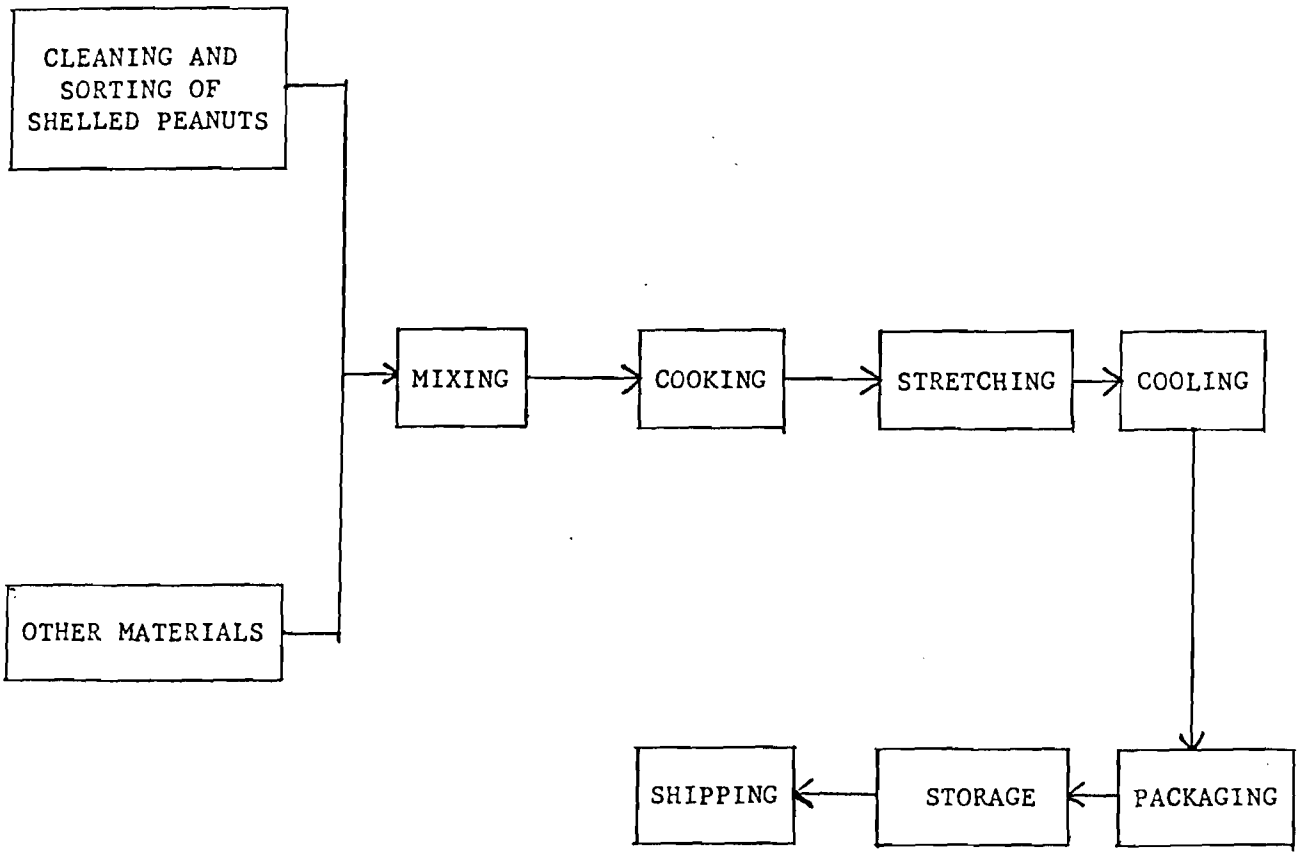
The processing of peanut brittle begins with cleaning and sorting shelled peanuts to remove foreign matter and defective kernels. Cleaned kernels are mixed with soda, sugar syrup, salt, and other ingredients and cooked in the candy kettles, after which it is ready for stretching and cooling. Sufficiently cooled brittle is broken into pieces and is weighed and packed automatically into boxes and overwraps. A processing flow chart is given in Figure 1.

Investment Requirements

Land, building, processing equipment, and auxiliary items constitute the fixed investment. One acre of land would be required for a 1,520 pounds-per-hour plant, and two acres would be required for a 3,040 pounds-per-hour plant. Building space includes office, plant, and storage. Total space was estimated at 15,600 square feet and 26,000 square feet for the respective plant sizes. The details are presented in Table 1. Cost estimates for land and building by location also are given in the table. Land cost in southwest Georgia is given at $13,000 per acre, compared to $180,000 per acre in the New York area, and $174,000 per acre in the Chicago area. Building cost was estimated at $29.63 per square foot in New York, $27.62 per square foot in Chicago, and $20.00 per square foot in southwest Georgia.

Investment requirements for processing equipment were estimated

Figure 1
Processing flow chart for peanut brittle



at $253,100 for a 1,520-pounds-per-hour plant and $397,400 for a 3,040-pounds-per-hour plant. These costs are itemized in Table 2. Investment requirements for packaging machinery were estimated at $190,000 for both the 1,520-pounds-per-hour and the 3,040-pounds-per-hour plant, because the same packaging set-up can be used on both. The details are given in Table 3. Auxiliary equipment for operating, testing, and office uses is listed in Table 4; these costs were estimated at $72,500 and $97,100 for the two given plant sizes.

Estimates of working capital requirements based on two months' raw materials and one month's finished goods, ranged from $475,000 for a 1,520-pounds-per-hour plant in southwest Georgia to $969,000 for a 3,040-pounds-per-hour plant in New York. Details are given in Table 5.

Production Costs

Variable Costs

Variable costs include raw materials, labor, containers, utilities, and miscellaneous items. These costs are discussed separately below.

Raw Materials -- The costs of raw materials constitute nearly one-half of total production costs, while peanuts comprise over one-half of the total costs of all materials. Materials used include peanuts, sugar, corn syrup, salt, soda, and belt release which is a material that separates the candy from working instruments. The amounts of these materials used in plants with hourly outputs of 1,520 pounds and 3,040 pounds are given in Table 6. Peanuts used are Floruner No. 1, Spanish No. 1, and Virginia No. 1. Their costs are estimated at 55 cents per pound in southwest Georgia, 58 cents in New York, and 57 cents in Chicago. Sugar costs are slightly higher in New York and Chicago than in southwest Georgia. The costs of other materials are about the same in all places. Amounts required, unit costs, and annual costs of these materials are also shown in the table. On the whole, southwest Georgia has a slight advantage over New York and Chicago.

Containers -- Paper boxes or folding cartons in the 12-oz., 10-oz., and 8-oz. sizes with overwraps inside are the standard packaging material. However, the 8-oz. size is used in this calculation. One carton, containing 24, 8-oz. boxes is the standard trade unit and is considered one case. The number of paper boxes and overwraps, and the number of cartons required for the two given plant sizes are presented in Table 7. Southwest Georgia has a slight advantage in container costs over New York and Chicago, because the Southeast is the largest supplier of raw materials for paper boxes and cartons. The unit cost of an 8-oz. paper box is estimated at $45 per thousand in southwest Georgia and $47 per thousand in New York and Chicago, while cartons may cost $340 per thousand in southwest Georgia and $370 per thousand in New York and Chicago. Overwraps may cost $32 per thousand. Annual costs for these containers are given in the table.

Labor - About 21 workers are required to operate a 1,520-pounds-per-hour plant and 32 workers for a 3,040-pounds-per-hour plant. Job titles of these workers and their wage rates are presented in Table 8. The wage rates in New York and Chicago are much higher than in southwest Georgia. Total labor costs would be 50 percent higher in New York and Chicago than in southwest Georgia.

Utilities -- Utilities include power, gas, and water. Power costs in New York are about 70 percent higher than in southwest Georgia. Costs of all utilities per hundred pounds of peanut brittle output were estimated at 63 cents in southwest Georgia, 117 cents in New York, and 69 cents in Chicago for a 1,520-pounds-per-hour plant; they were estimated at 57 cents in southwest Georgia, 105 cents in New York, and 62 cents in Chicago for a 3,040-pounds-per-hour plant. Annual utility costs are presented in Table 9.

Miscellaneous -- Other operating expenses are estimated at one percent of the total variable costs. For the two given plant sizes, these costs are given in Table 16.

Fixed Costs

Fixed costs or general expenses may include administrative personnel, depreciation, interest, ad valorem taxes, insurance, and miscellaneous.

Administrative Personnel -- A plant manager would be responsible for both production and marketing, and a number of stenographers and clerks would be hired to assist the manager in bookkeeping. The personnel required and their salaries are estimated in Table 10. New York and Chicago salaries average about a third higher than those in southwest Georgia.

Depreciation -- An annual depreciation schedule for building and machinery is shown in Table 11. The building would be amortized in 15 years, machinery in 7 years, and auxiliary equipment in 5 years. The difference in depreciation expenses among the locations is due to the higher value of the building in New York and Chicago.

Interest -- Interest was estimated for both fixed investment and working capital. The interest rate on fixed investment is given at 15 percent annually, while the rate on working capital is shown at 15 percent for six months. Sales revenue would supply necessary working capital after the initial six months. Details are given in Table 12.

Ad Valorem Taxes -- Ad valorem taxes are much higher in New York than either southwest Georgia or Chicago. The rates are given below:

Southwest Georgia:	Assessment: 40 percent of real market value Rate: $21.47 per $1,000 assessed value
New York:	Assessment: 100 percent of real market value Rate: $8.95 per $100 market value

Chicago: Assessment: 40 percent of real market value
Rate: $9.819 per $100 market value

Based on these rates, annual property taxes for the two plant sizes are given in Table 13. The taxes in New York are over two times those in Chicago, and 16 times those in southwest Georgia.

Insurance -- The rates for fire and other extended risks coverage in southwest Georgia are 16 cents per hundred dollars on building, machinery, and equipment and about 24 cents per hundred dollars on such contents as raw materials and finished goods. The respective rates in New York are 54 cents and 56 cents. The corresponding rates in Chicago are 20 cents and 20 cents. It is assumed that no more than two weeks' raw materials and finished goods would be stored in plants at any time. Annual insurance costs are presented in Table 14 by plant size and by location.

Miscellaneous -- Expenses such as office supplies, telephone, telegraph, and other small items are estimated roughly at 7 percent of the total fixed costs. These costs are given in Table 16 for the two plant models by locations.

POTENTIAL RETURNS

Sales Revenues and Expenses -- Sales of peanut brittle are based on either f.o.b. prices or delivered prices. The f.o.b. price of a case containing 24 8.36875-oz. boxes is $14.64. The delivered price was chosen for two reasons. One is the relative large volume of production of the plant models in this study compared with the size of the peanut brittle market. According to the demand analysis given in a previous section, the demand for peanut brittle in 1979 was estimated at 16 million pounds nationally, 8.5 million pounds in the eastern market, and 3.2 million pounds in the southeastern region. Since the two plant sizes adopted in this cost study are 3 million pounds and 6 million pounds annually, it is obvious that national distribution would be necessary. The second reason is that interviews indicated there are only a few major producers involved in the manufacture of peanut brittle and they have to sell this product nationwide.

Delivered prices are derived by adding freight-out costs to the given f.o.b. price per case. Freight-out cost for a plant serving the national market are shown in the transportation analysis. According to the analysis, freight-out costs for national distribution would be $4.23 per hundredweight in New York, New York, which is slightly higher than the $3.83 calculated for Chicago, Illinois, and $3.30 calculated for Albany, Georgia. In order to have a uniform price throughout the nation, New York's freight-out costs were adopted to arrive at the delivered price. Based on a gross weight of 16 pounds per case (12.5531 pounds net weight), New York freight-out costs would average 68 cents per case. Therefore, a delivered price of $15.32 per

case for national distribution was adopted. The two plant models would produce 242,170 and 484,340 cases, respectively, in a year, and gross sales would amount to $3,710,044 and $7,420,089 respectively. The details are given in Table 15.

Sales expenses include cash discounts, brokerage fees, and advertising and promotion. The trade practice is to give a 2 percent cash discount to a customer for payment within a 10-day period; it is assumed that half of the gross sales would carry this discount. Brokerage fees are assumed at 5 percent of gross sales, while advertising and promotion efforts would cost about 3 percent of the sales revenues.

All costs associated with the two plant models are summarized in Table 16. Southwest Georgia has a distinct advantage in both variable costs and general expenses over New York and Chicago. In terms of total costs, a southwest Georgia plant, producing 1,520 pounds per hour, could save nearly $445,000 and $357,000 annually, compared with its New York and Chicago counterparts; for a 3,040-pounds-per-hour plant, the savings would be $778,000 and $574,000 a year.

Total cost per pound of peanut brittle produced averages 90.59 cents and 86.25 cents for the two plant sizes in Albany. These costs are about 15 cents to 10 cents higher in New York and Chicago. See Table 16 for details.

Taxes and Potential Profits -- A summary statement of costs and profits, given in Table 17, is divided into two sections: income and profitability indicators. Under the income section, all expenses and taxes are deducted from the gross sales in order to arrive at net income. Federal corporate income taxes are 48 percent, while state taxes are 6 percent in Georgia, 10 percent in New York, and 6.85 percent in Illinois. For the two given plant sizes, net income for a 1,520-pounds-per-hour plant in southwest Georgia is over twice that of the New York plant, and 62 percent higher than the Chicago plant; for a 3,040-pounds-per-hour plant, the net income in southwest Georgia is 70 percent higher than in New York, and 38 percent higher than in Chicago.

Profit margin or net income as a percentage of gross sales is about 12 percent and 13 percent, respectively, for the two given plant sizes in southwest Georgia, while it is only 6 percent and 8 percent for the corresponding plants in New York, and 7 percent and 10 percent in Chicago. The returns on total assets are 33 percent and 46 percent for the two model plants in southwest Georgia, 13 percent and 21 percent in New York, and 17 percent and 27 percent in Chicago. The payout period ranges from two years in southwest Georgia, from four to five years in New York, and from three to four years in Chicago. The details are given in Table 17.

Table 1. Investment requirements on land and building for two given plant sizes and three locations for peanut brittle processing, 1981.

	Plant Size in Pounds per Hour	
	1,520	3,040
Space Estimates		
Land in Acres	1	2
Building Space in Square Feet:		
Office	600	1,000
Plant	3,000	5,000
Storage	12,000	20,000
Total	15,600	26,000
Cost Estimates		
Southwest Georgia:		
Land ($13,000 per acre)	$ 13,000	$ 26,000
Building ($20.00 per square foot)	312,000	520,000
Total	325,000	546,000
New York, New York:		
Land ($180,000 per acre)	$ 180,000	$ 360,000
Building ($29.63 per square foot)	462,228	770,380
Total	642,228	1,130,380
Chicago, Illinois:		
Land ($174,000 per acre)	$ 174,000	$ 348,000
Building ($27.62 per square foot)	430,872	718,120
Total	604,872	1,066,120

Table 2. Investment requirements on peanut brittle processing machinery for the two given plant sizes, 1981.

	1,520 Pounds Per Hour		3,040 Pounds Per Hour	
	Number	Cost	Number	Cost
Peanut Department				
Gravity Table	1	$ 15,000	1	$ 15,000
Destoner	1	10,000	1	10,000
Magnet	1	300	1	300
Electric Color Sorter	1	25,000	1	25,000
Conveyor Elevator	3	1,500	3	1,500
Inspection Tables	1	1,500	1	1,500
Subtotal		$ 53,300		$ 53,300
Syrup Department				
Candy Kettle	1	3,000	2	6,000
Syrup Pump	1	1,600	2	3,200
Piping	1	2,000	1	4,000
Syrup Tank	1	25,000	1	25,000
Subtotal		$ 31,600		$ 38,200
Cooking Department				
Continuous Cooker	1	$ 34,800	2	$ 69,600
Cooker Vent System	1	3,000	1	6,000
Soda Dispenser	1	2,000	2	4,000
Soda Mixer	1	3,000	2	6,000
Stretching Machine	1	34,400	2	68,800
Cooling Tunnel	1	21,000	2	42,000
Working Platform	1	3,000	2	6,000
Roller Conveyer	1	2,000	2	4,000
Boiler	1	14,000	1	21,000
Air Conditioner	1	6,000	1	6,000
Installation		25,000		40,000
Wiring		15,000		25,000
Freight and Taxes		5,000		7,500
Subtotal		$ 168,200		$ 305,900
TOTAL		$ 253,100		$ 397,400

Table 3. Investment requirements on the packaging machinery for peanut brittle processing, 1981.

Machinery	Number	Cost
Carton Former (double head)	1	$ 20,000
Automatic Weigher	2	50,000
Check Weigher	1	20,000
Metal Detector	1	7,000
Carton Closer	1	25,000
Overwrap Machine	1	40,000
Semiautomatic Case Packer	1	15,000
Installation		12,000
Freight		1,000
TOTAL		$ 190,000

Table 4. Auxiliary equipment for operating, testing, and office uses in peanut brittle plants and estimated costs, 1981.

Item	1,520 Pounds Per Hour		3,040 Pounds Per Hour	
	Number	Cost	Number	Cost
Electric Forklift	1	$ 18,000	1	$ 18,000
Battery and Charger	1	5,000	1	5,000
Air Compressor	1	2,500	1	2,500
Air Conditioning System	1	20,000	1	30,000
Pallets	200	1,000	300	1,500
Testing Equipment	1	1,000	1	1,600
Fire Protection		6,000		10,000
Office Furniture		10,000		15,000
Office Machine		5,000		7,500
Miscellaneous		4,000		6,000
TOTAL		$ 72,500		$ 97,100

Table 5. Working capital requirements for peanut brittle processing by plant size and location, 1981.

Location	Plant Size in Pounds Per Hour	One Month Finished Goods	Two Months Raw Materials	Total
Southwest Georgia	1,520	$295,000	$180,000	$475,000
	3,040	591,000	360,000	951,000
New York, N.Y.	1,520	295,000	189,000	484,000
	3,040	591,000	378,000	969,000
Chicago, Illinois	1,520	295,000	187,000	482,000
	3,040	591,000	374,000	965,000

Table 6. Annual raw material requirements for peanut brittle processing, by plant size and location, 1981.

(For a 1,520-pounds-per-hour plant)

	Raw Material Input in Pounds			Southwest Georgia		New York		Chicago	
	Per Hour	Per Day	Per Year	Unit Price	Annual Cost	Unit Price	Annual Cost	Unit Price	Annual Cost
Corn Syrup	1,000	8,000	2,000,000	15 cents	$ 300,000	15 cents	$ 300,000	15 cents	$ 300,000
Peanuts	550	4,400	1,100,000	55 cents	605,000	58 cents	638,000	57 cents	627,000
Sugar	300	2,400	600,000	27 cents	162,000	30 cents	180,000	30 cents	180,000
Soda	16	128	32,000	14 cents	4,480	14 cents	4,480	14 cents	4,480
Salt	6	48	12,000	6 cents	720	6 cents	720	6 cents	720
Belt Release	3	24	6,000	1.5 dollars	9,000	1.5 dollars	9,000	1.5 dollars	9,000
TOTAL					$ 1,081,200		$ 1,132,200		$ 1,121,200

(For a 3,040-pounds-per-hour plant)

	Raw Material Input in Pounds			Southwest Georgia		New York		Chicago	
	Per Hour	Per Day	Per Year	Unit Price	Annual Cost	Unit Price	Annual Cost	Unit Price	Annual Cost
Corn Syrup	2,000	16,000	4,000,000	15 cents	$ 600,000	15 cents	$ 600,000	15 cents	$ 600,000
Peanuts	1,100	8,800	2,200,000	55 cents	1,210,000	58 cents	1,276,000	57 cents	1,254,000
Sugar	600	4,800	1,200,000	27 cents	324,000	30 cents	360,000	30 cents	360,000
Soda	32	256	64,000	14 cents	8,960	14 cents	8,960	14 cents	8,960
Salt	12	96	24,000	6 cents	1,440	6 cents	1,440	6 cents	1,440
Belt Release	6	48	12,000	1.5 dollars	18,000	1.5 dollars	18,000	1.5 dollars	18,000
TOTAL					$ 2,162,400		$ 2,264,400		$ 2,242,400

Table 7. Annual requirements for containers for packaging peanut brittle and estimated costs, by plant size and location, 1981.

Type of Containers	Annual Number Required Size in Pounds Per Hour 1,520	3,040	Annual Costs in Southwest Georgia Unit Price Per Thousand	Size in Pounds Per Hour 1,520	3,040	Annual Costs in New York and Chicago Unit Price Per Thousand	Size in Pounds Per Hour 1,520	3,040
Folding Cartons* 8-oz.	6,102,700	12,205,400	$ 45	$ 274,622	$ 549,243	$ 47	$ 286,827	$ 573,654
Corrugated Cartons 24 pkgs/case	253,333	506,666	340	86,133	172,266	370	93,733	187,466
Overwraps*	6,102,700	12,205,400	32	195,286	390,572	32	195,286	390,572
TOTAL				$ 556,041	$ 1,112,081		$ 575,846	$ 1,151,692

*Including 5 percent waste

Table 8. Labor requirements and estimated annual costs, by job classification and by given location, for peanut processing, 1981.

		Southwest Georgia			
		1,520 Pounds Per Hour		3,040 Pounds Per Hour	
	Hourly Rate	Number	Annual Cost	Number	Annual Cost
Foreman	$ 6.50	1	$ 13,520	2	$ 27,040
Premix Dept.	5.80	1	12,064	2	24,128
Peanut Dept.	5.00	3	31,200	6	62,400
Brittle Machine	6.00	4	49,920	8	99,840
Packing Dept.	4.70	7	68,432	7	68,432
Maintenance Dept.	6.50	1	13,520	1	13,520
Shipping and Receiving	5.00	2	20,800	3	31,200
Cleanup and Odd Jobs	4.50	2	18,720	3	28,080
		21	$ 228,176	32	$ 354,640
Fringe Benefits, 15%			34,226		53,196
TOTAL			$ 262,402		$ 407,836
		New York and Chicago			
Foreman	10.00	1	20,800	2	41,600
Premix Dept.	8.70	1	18,096	2	36,192
Peanut Dept.	7.50	3	46,800	6	93,600
Brittle Machine	9.00	4	74,880	8	149,760
Packing Machine	7.00	7	101,920	7	101,920
Maintenance Dept.	9.75	1	20,280	1	20,280
Shipping and Receiving	7.50	2	31,200	3	46,800
Cleanup and Odd Jobs	6.75	2	28,080	3	42,120
		21	$ 342,056	32	$ 532,272
Fringe Benefits, 15%			51,308		79,841
			$ 393,364		$ 612,113

Table 9. Estimated utility costs for the processing of peanut brittle, by plant size and location, 1981.

Plant Size in Pounds Per Hour	Annual Output in Pounds	Southwest Georgia		New York		Chicago	
		Cost Per 100 Pounds of Output	Annual Cost	Cost Per 100 Pounds of Output	Annual Cost	Cost Per 100 Pounds of Output	Annual Cost
1,520	3,040,000	63 cents	$ 19,152	117 cents	$ 35,568	69 cents	$ 20,976
3,040	6,080,000	57 cents	$ 34,656	105 cents	$ 63,840	62 cents	$ 37,696

Table 10. Administrative personnel requirements and estimated salary costs for peanut brittle plants, by plant size and location, 1981.

Personnel	1,520 Pounds Per Hour			3,040 Pounds Per Hour		
		Annual Cost			Annual Cost	
	Number	Southwest Georgia	New York and Chicago	Number	Southwest Georgia	New York and Chicago
Plant Manager	1	$ 20,000	$ 28,000	1	$ 25,000	$ 32,000
Stenographer	1	10,000	13,000	1	10,000	13,000
Production Clerk	1	9,000	12,000	2	18,000	24,000
Bookkeeping	2	20,000	28,000	3	30,000	42,000
Billing Clerk	1	10,000	13,000	2	20,000	26,000
		$ 69,000	$ 94,000		$ 103,000	$137,000
Fringe Benefits, 20%		13,800	18,800		20,600	27,400
TOTAL		$ 82,800	$112,800		$ 123,600	$164,400

Table 11. Annual depreciation expenses on building and equipment, by plant size and location, 1981.

Southwest Georgia

Item	Life (Year)	1,520 Pounds Per Hour Value	1,520 Pounds Per Hour Annual Depreciation	3,040 Pounds Per Hour Value	3,040 Pounds Per Hour Annual Depreciation
Building	15	$312,000	$ 20,800	$ 520,000	$ 34,666
Machinery	7	443,100	63,300	587,400	83,914
Auxiliary Equipment	5	72,500	14,500	97,100	19,420
TOTAL			$ 98,600		$ 138,000

New York, New York

Item	Life (Year)	1,520 Pounds Per Hour Value	1,520 Pounds Per Hour Annual Depreciation	3,040 Pounds Per Hour Value	3,040 Pounds Per Hour Annual Depreciation
Building	15	$462,228	$ 30,815	$ 770,380	$ 51,359
Machinery	7	443,100	63,300	587,400	83,914
Auxiliary Equipment	5	72,500	14,500	97,100	19,420
TOTAL			$ 108,615		$ 154,693

Chicago, Illinois

Item	Life (Year)	1,520 Pounds Per Hour Value	1,520 Pounds Per Hour Annual Depreciation	3,040 Pounds Per Hour Value	3,040 Pounds Per Hour Annual Depreciation
Building	15	$430,872	$ 28,725	$ 718,120	$ 47,875
Machinery	7	443,100	63,300	587,400	83,914
Auxiliary Equipment	5	72,500	14,500	97,100	19,420
TOTAL			$ 106,525		$ 151,209

Table 12. Annual interest expenses for peanut brittle processing, by plant size and location, 1981.

Southwest Georgia

Item	Rate	1,520 Pounds Per Hour Principal	1,520 Pounds Per Hour Annual Interest	3,040 Pounds Per Hour Principal	3,040 Pounds Per Hour Annual Interest
Fixed Investment	15%	$ 840,600	$ 126,090	$ 1,230,500	$ 184,575
Working Capital (6 months)	15%	475,000	35,625	951,000	71,325
TOTAL			$ 161,715		$ 255,900

New York, New York

Item	Rate	1,520 Pounds Per Hour Principal	1,520 Pounds Per Hour Annual Interest	3,040 Pounds Per Hour Principal	3,040 Pounds Per Hour Annual Interest
Fixed Investment	15%	$1,157,828	$ 173,674	$ 1,814,880	$ 272,232
Working Capital (6 months)	15%	484,000	36,300	969,000	72,675
TOTAL			$ 209,974		$ 344,907

Chicago, Illinois

Item	Rate	1,520 Pounds Per Hour Principal	1,520 Pounds Per Hour Annual Interest	3,040 Pounds Per Hour Principal	3,040 Pounds Per Hour Annual Interest
Fixed Investment	15%	$1,120,472	$ 168,071	$ 1,750,620	$ 262,593
Working Capital (6 months)	15%	482,000	$ 36,150	965,000	72,375
TOTAL			$ 204,221		$ 334,968

Table 13. Annual ad valorem taxes by plant size and location, 1981.

Southwest Georgia

Plant Size in Pounds Per Hour	Property Value	Assessed Value	Annual Taxes
1,520	$ 540,600	$ 336,240	$ 7,219
3,040	1,230,500	492,200	10,568

New York, New York

Plant Size in Pounds Per Hour	Property Value	Assessed Value	Annual Taxes
1,520	$1,157,828	$1,157,828	$103,626
3,040	1,814,880	1,814,880	162,432

Chicago, Illinois

Plant Size in Pounds Per Hour	Property Value	Assessed Value	Annual Taxes
1,520	$1,120,472	$ 448,189	$ 44,008
3,040	1,750,620	700,248	68,757

NOTE: See text for assessment percentages and tax rates.

Table 14. Annual insurance costs for a peanut brittle processing plant, by size and location, 1981.

Southwest Georgia

Item	1,520 Pounds Per Hour		3,040 Pounds Per Hour	
	Value	Insurance Cost	Value	Insurance Cost
Building and Machinery	$827,600	$1,324	$1,204,500	$1,927
Raw Materials and Finished Goods	180,940	434	360,880	866
TOTAL		$1,758		$2,793

New York, New York

Item	1,520 Pounds Per Hour		3,040 Pounds Per Hour	
	Value	Insurance Cost	Value	Insurance Cost
Building and Machinery	$977,828	$5,280	$1,454,880	$7,856
Raw Materials and Finished Goods	183,133	1,025	366,266	2,051
TOTAL		$6,305		$9,907

Chicago, Illinois

Item	1,520 Pounds Per Hour		3,040 Pounds Per Hour	
	Value	Insurance Cost	Value	Insurance Cost
Building and Machinery	$946,472	$1,893	$1,402,620	$2,805
Raw Materials and Finished Goods	182,710	365	365,420	731
TOTAL		$2,258		$3,536

Table 15. Annual production and projected f.o.b. sales for peanut brittle processing, by plant size, 1981.

Production Volume	1,520 Pounds Per Hour Plant	3,040 Pounds Per Hour Plant
Pounds/Day[1/]	12,160	24,320
Pounds/Year[2/]	3,040,000	6,080,000
Packages/Year[3/]	5,812,098	11,627,197
Cases/Year[4/]	242,170	484,340
F.O.B. Price/Case	$ 14.64	$ 14.64
Delivered Price/Case	$ 15.32	$ 15.32
Annual Sales	$ 3,710,044	$ 7,420,089

1/ 8 hours a day

2/ 250 days a year

3/ 16 ozs. a pound and 8.36875 ozs. a package.

4/ 24 packages a case

Table 16. Estimated annual costs and earnings for a peanut brittle processing plant, by size and location, 1981.

	Southwest Georgia		New York, New York		Chicago, Illinois	
	Size in Pounds Per Hour		Size in Pounds Per Hour		Size in Pounds Per Hour	
Sales	1,520	3,040	1,520	3,040	1,520	3,040
Volume in Pounds	3,040,000	6,080,000	3,040,000	6,080,000	3,040,000	6,080,000
Dollars	$ 3,710,044	$ 7,420,089	$ 3,710,044	$ 7,420,089	$ 3,710,044	$ 7,420,089
Sales Expenses						
Cash Discount, 2% of 1/2 Sales	37,100	74,200	37,100	74,200	37,100	74,200
Brokerage Fees, 5%	185,500	371,000	185,500	371,000	185,500	371,000
Advertising & Promotion, 3%	111,300	222,600	111,300	222,600	111,300	222,600
Freight out	105,400	254,813	127,406	326,624	141,691	293,342
Subtotal	439,300	922,613	461,306	994,424	475,591	961,142
Variable Costs						
Raw Materials (Table 6)	1,081,200	2,162,400	1,132,200	2,264,400	1,121,200	2,242,400
Packaging Containers (Table 7)	556,041	1,112,082	575,846	1,151,692	575,846	1,151,692
Labor (Table 8)	262,402	407,836	393,364	612,113	393,364	612,113
Utilities (Table 9)	19,152	34,656	35,568	63,840	20,976	37,696
Miscellaneous (1% above)	19,200	37,200	21,400	40,900	21,000	40,400
Subtotal	1,937,995	3,754,174	2,158,378	4,132,945	2,132,386	4,084,301
General Expenses						
Administrative (Table 10)	82,800	123,600	112,800	164,400	112,800	164,400
Depreciation (Table 11)	98,600	138,000	108,615	154,693	106,525	151,209
Interest (Table 12)	161,715	255,900	209,974	344,907	204,221	334,968
Ad Valorem Taxes (Table 13)	7,219	10,568	103,626	162,432	44,008	68,757
Insurance (Table 14)	1,758	2,793	6,305	9,907	2,258	3,536
Miscellaneous (7% above)	24,600	37,000	37,900	58,500	32,900	50,600
Subtotal	376,692	567,861	579,220	894,839	502,712	773,470
Total Costs	$ 2,753,987	$ 5,244,648	$ 3,198,904	$ 6,022,208	$ 3,110,689	$ 5,818,913
Cost Per Pound (cents)						
Sales Expenses	14.45	15.17	15.17	16.36	15.64	15.81
Variable Costs	63.75	61.74	71.00	67.97	70.14	67.17
General Expenses	12.39	9.34	19.05	14.72	16.54	12.72
Total Costs	90.59	86.25	105.22	99.05	102.32	95.70

Table 17. Summary statement of estimated costs and profits of peanut brittle processing, based on plant size and location, 1981.

Income	Southwest Georgia		New York, New York		Chicago, Illinois	
	Size in Pounds Per Hour		Size in Pounds Per Hour		Size in Pounds Per Hour	
	1,520	3,040	1,520	3,040	1,520	3,040
Gross Sales:	$ 3,710,044	$ 7,420,089	$ 3,710,044	$ 7,420,089	$ 3,710,044	$ 7,420,089
Variable Costs	1,937,995	3,754,174	2,158,378	4,132,945	2,132,386	4,084,301
Variable Profits:	1,772,049	3,665,915	1,551,666	3,287,144	1,577,658	3,335,788
Sales Expenses	439,300	922,613	461,306	994,424	475,591	961,142
Out-of-pocket Fixed Costs	278,092	429,861	470,605	740,146	396,187	622,261
Case Income:	1,054,657	2,313,441	619,755	1,552,574	705,880	1,752,385
Depreciation	98,600	138,000	108,615	154,693	106,525	151,209
Net Income before Taxes:	956,057	2,175,441	511,140	1,397,881	599,355	1,601,176
Federal Taxes, 48%	458,907	1,044,211	245,347	670,982	287,690	768,564
State Taxes*	57,363	130,526	51,114	139,788	41,055	109,681
Net Income	$ 439,787	$ 1,000,704	$ 214,679	$ 587,111	$ 270,610	$ 722,931
Profitability Indicators						
Profit Margin, %	11.85	13.49	5.79	7.91	7.29	9.74
Return on Total Assets, %	33.43	45.88	13.08	21.09	16.89	26.62
Payout Period, Years	2.4	1.9	5.1	3.8	4.3	3.1

*State corporate income taxes: Georgia 6%, New York 10%, Illinois 6.85%.

COMPARATIVE PLANT AND OPERATING COST ANALYSIS FOR SALTED PEANUTS PROCESSING

In this study, southwest Georgia is compared as a location for a salted peanuts processor to Suffolk, Va., a leading region for the salted peanut supply in the nation.

Two plant sizes are used in this study -- a 2,000-pounds-per-hour output and a 4,000-pounds-per-hour output. Based on two 8-hour shifts a day and 250 working days a year, the 2,000-pounds-per-hour plant would produce 8 million pounds of salted peanuts a year, while the 4,000-pounds-per-hour plant would yield 16 million pounds a year.

Nearly all plants engaged in the processing of salted peanuts include other nuts as well, because a mixed-nuts plant is essential to success in marketing. Such nuts as pecans, cashews, brazil nuts, and almonds are commonly processed in the same plant with peanuts. For simplicity, only peanuts are considered in this study.

The term "salted peanuts" generally refers to oil-fried and salted peanuts. However, the products of dry roasting peanuts with salt also may be regarded as salted peanuts even though they are called dry roasted peanuts in the trade. In this cost study, only peanuts procesed by the oil-fried method are considered.

Processing Procedures

The processing of salted peanuts may be divided into five major steps:

1. Roasting
2. Blanching
3. Sorting and Inspecting
4. Frying and Salting
5. Packaging

These steps are discussed below.

Roasting -- Shelled peanuts are placed in a roaster. Time and temperature of roasting will vary with the character of the nuts and size of the batch roasted, but the temperature is generally around 350 degrees and time from 30 to 40 minutes. After roasting, peanuts are cooled in boxes or trays, with perforations in the bottom allowing air to be drawn through the layer of nuts.

Blanching -- After cooling, peanuts are fed directly to a blancher. Blanching consists of removing the skin and heart from the peanut and is carried out by passing the peanuts through a blanching unit. Skins are collected and saved for animal feed or for by-product use. The heart is removed because its presence detracts from product appearance. Spanish peanuts are customarily salted without removing the thin brown skins, although a few peanut packers remove the skins.

Sorting and inspecting -- After blanching, peanuts are stored in hoppers ready for sorting to remove shriveled, discolored, rancid, decayed, mouldy, sprouted, or damaged peanuts and foreign materials. Sorting can be done either by hand or electronic sorters. Calculations in this study assume the use of electronic sorters.

Frying and salting -- After sorting, peanuts are weighed and placed in an open mesh wire basket which is lowered into a cooking kettle. Different types of oil may be used for frying, but few producers use peanut oil currently because of the short supply and high cost. Frying temperatures and timing vary according to type of nut, and the size and capacity of the cooking equipment. Generally, small nuts should be quickly fried at high temperatures, and the larger nuts should be fried at lower temperatures. An oil change should be made when the moisture content of the oil exceeds 2 to 4 percent.

After frying, peanuts are spread on a tilting-type, perforated, cooling and salting tray so that excess oil will rapidly drain away. Flake-type salt with antioxidants is added in amounts constituting about 2 percent of the peanut volume.

Packaging -- Salted peanuts are packed either in cans or cellophane bags. After filling, these cans or bags are closed and sealed, put in cartons, and made ready for shipment. A typical salted nut processing diagram is given in Figure 1.

Investment Requirements

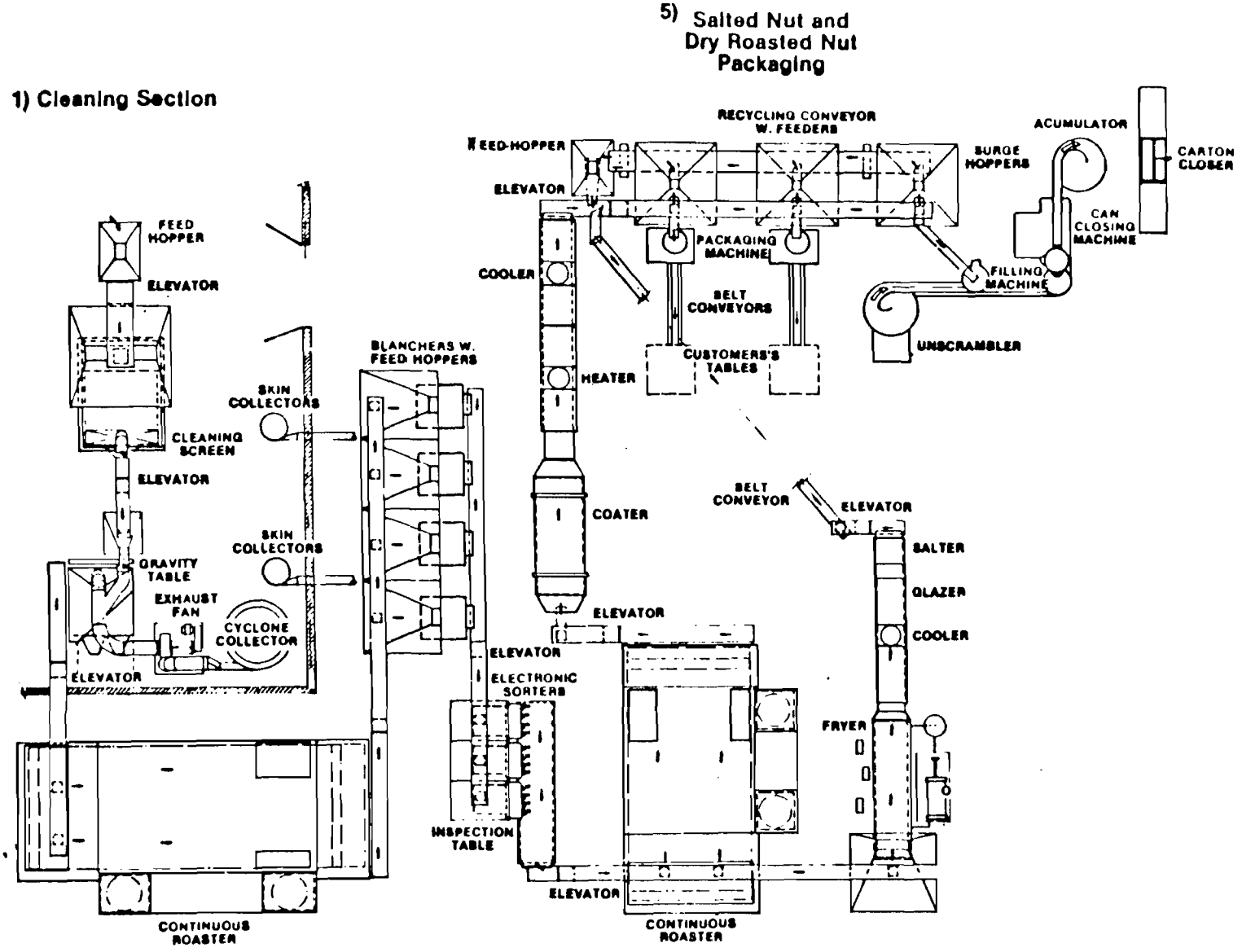
Investment requirements include fixed investments and working capital. Fixed investments comprise land, building, processing equipment, packaging equipment, and auxiliary equipment, each of which is discussed separately below.

Land and building -- One acre of land is needed for a 2,000-pounds-per-hour plant, and two acres are required for a 4,000-pounds-per-hour plant. Land costs in southwest Georgia are quoted at $13,000 per acre, while $14,000 per acre is registered in Suffolk. The land considered is in industrial parks. Building space consists of office, plant, and storage.

The storage space is four times that of production space. Total building space is estimated at 15,600 square feet for a 2,000-pounds-per-hour plant and at 26,000 square feet for a 4,000-pounds-per-hour plant. Building costs are estimated at $20.00 per square foot in southwest Georgia and at $21.36 per square foot in Suffolk (see Table 1). The costs of land and building are presented in Table 1.

Processing equipment -- Processing equipment for salted peanuts

Figure 1
A Typical Salted Nut Processing System



Courtesy Neumunz, Inc.

includes cleaning, roasting, blanching, sorting, frying, salting and packaging sections. Estimated costs on each section are given in Table 2. Total costs, including freight in, installation, and wiring, are estimated at $422,500 for a 2,000-pounds-per-hour plant and at $753,600 for a 4,000-pounds-per-hour plant.

Auxiliary equipment -- Auxiliary equipment includes forklift trucks, batteries and chargers, air compressors, pallets, testing equipment, fire protection systems, office furniture, office machinery, and other items (see Table 3). Total costs are estimated at $56,000 and $99,000 for the two given plant sizes.

Working capital is estimated on the basis of two months' raw materials and one months's finished goods. Working capital requirements in the southwest Georgia area are given at $2,092,000 and $4,184,000 for the two plant sizes. In the Suffolk area, the estimates are $2,107,000 and $4,213,000. The slightly higher requirement in Suffolk over southwest Georgia is due to a difference in peanut costs between the two places (see Table 4).

Production Costs

Production costs for processing salted peanuts can be classified as variable costs and general expenses or fixed costs. Variable costs include raw materials, labor, containers, utilities, and miscellaneous, while general expenses consist of administrative personnel, depreciation, interest, ad valorem taxes, insurance, and miscellaneous.

Variable Costs

Raw materials -- Raw materials used include shelled peanuts, salt, frying oil, and nitrogen. Since peanuts account for roughly half of the total cost of salted peanut processing and marketing, their choice and purchase price are of utmost importance. Runner, Spanish and Virginia varieties are used in salted peanuts; however, the type chosen affects the kind of container used, equipment outlay, and sales revenues. In this study, it is assumed that all three main varieties are used.

Spanish No. 1, small Spanish, Runner No. 1, Virginia Bunch, and Virginia Jumbo are commonly used in salted peanuts. At the time this report was written, shelled peanut prices were extremely high at $1.10 to $1.30 per pound, because of a poor harvest last year. Prices are expected to return to normal this fall. A projected price of 55 cents per pound is used for southwest Georgia and a price of 56 cents per pound is adopted in Suffolk. Trade sources indicate that historically Virginia-type peanuts grown in Georgia are lower priced than those grown in the Virginia-Carolina area. Processing loss of shelled peanuts is assumed at 6.5 percent per hundredweight.

A flake-type salt is used, with antioxidants added. Salt requirements are assumed at 2 percent per hundredweight of salted peanut output. Cost per pound is estimated at 7 cents.

Estimates of the amount of oil required for frying are based on two factors. First, for every 125 pounds of peanuts fried, six pounds of fresh oil must be added to replace that lost in the frying process. Second, oil in the fryer must be completely changed whenever the moisture content exceeds 2 to 4 percent, or approximately three times weekly; this requires about one pound of oil for every 15 pounds of shelled peanuts. Oil costs about 40 cents per pound. Nitrogen is used to preserve the fresh taste of salted peanuts in the package. Its cost together with other additional ingredients, are estimated at one percent of total raw material costs. The volume, unit price, and annual cost of each raw material are given for the two plant sizes and locations in Table 5.

Containers -- Two types of containers are used -- lithographed cans and cellophane bags. It is assumed that about 49 percent of salted peanuts produced is packed in cans, and the remaining 51 percent in bags. Can sizes of 6.5 ozs. and 13 ozs. are used, while bag sizes of 1.5 ozs., 3 ozs., 5 ozs. are assumed in this study. Table 6 shows the type of container, case size, number of cases, and estimated unit cost and total container costs.

Labor -- It is estimated that 20 workers would be required to run a 2,000-pounds-per-hour plant in a two-shift operation, while 31 workers would be needed to run a 4,000-pounds-per-hour plant. Wage rates are slightly higher in Suffolk than in southwest Georgia. Fifteen percent is added above wage costs in order to cover fringe benefits. Job classifications, hourly rates, and annual labor costs are shown in Table 7 for the given plant sizes and locations.

Utilities -- Utilities include power, gas, and water. The cost of utilities is estimated at 70 cents per hundred pounds of salted peanut output for a 2,000-pounds-per-hour plant and 65 cents per hundred pounds of salted peanut output for a 4,000-pounds-per-hour plant in southwest Georgia. The utility costs (gas and electricity) in Suffolk are 40 percent higher than southwest Georgia. The details are given in Table 8.

Fixed Costs

Administrative personnel -- A plant manager would take care of sales and production affairs, and a number of stenographers, bookkeepers, and clerks would be hired to assist the manager. The personnel required and their salaries are estimated in Table 9. Suffolk salaries are slightly higher than southwest Georgia. Fifteen percent is added to personnel salaries to account for employees' fringe benefits. The cost difference between Albany and Suffolk is slight.

Depreciation -- Funds should be reserved to cover the cost of depreciation even though it is not a cash outlay. The building would be amortized in 20 years, machinery in 10 years, and auxiliary equipment in 7 years. Depreciation costs are given in Table 10 by plant size and location. The difference between costs in southwest Georgia and Suffolk is negligible.

Interest -- Interest paid for capital used is given at 15 percent for fixed investments and working capital. Funds for working capital should have to be borrowed for only the first six months of operation; by that time, sales revenues should be sufficient to cover operating expenses. Details are presented in Table 11.

Ad valorem taxes -- Ad valorem tax rates for both southwest Georgia (Albany) and Suffolk are given below:

Southwest Georgia:	Assessment: 40 percent of real market value Rate: $21.47 per $1,000 assessed value
Suffolk:	For real estate Assessment: 100 percent of real market value Rate: $0.95 per $100 assessed value
	For machinery and equipment 1-5 years old: Assessment at 10 percent of original value
	Over 5 years old: Assessment at 5 percent of original value Rate: $4 per $100

Annual property taxes, based on the above rates, are shown in Table 12. It appears that southwest Georgia (Albany) has slightly higher ad valorem taxes.

Insurance -- Southwest Georgia (Albany) and Suffolk have different insurance rates for fire and other extended risks. In southwest Georgia, these rates are 16 cents per hundred dollars on building, machinery, and other equipment and about 24 cents per hundred dollars on such contents as raw materials and finished goods. In Suffolk, the rates are 24.3 cents per hundred dollars on building, machinery, and other equipment and 40.9 cents per hundred dollars on raw materials and finished goods. Annual insurance costs for the two plant sizes in southwest Georgia and Suffolk are estimated in Table 13.

Miscellaneous -- Miscellaneous overhead costs, such as office supplies, telephone and telegraph, and association dues, are estimated at roughly 7 percent of the total general expenses. They range from $30,000 for a 2,000-pounds-per-hour plant to $56,000 for a 4,000-pounds-per-hour plant.

Potential Returns

Sales revenues and expenses -- Sales revenues for the two given plant sizes are shown in Table 14, which provides a detailed breakdown on the types of containers used, case size, unit price, and gross sales. Unit prices per case are delivered prices, and there is one pricing system throughout the nation. Gross sales are estimated at $15,114,000 for a 2,000-pounds-per-hour plant producing 8 million pounds of salted peanuts a year. They are calculated at $30,228,000 for a 4,000-pounds-per-hour plant with an annual output of 16 million pounds of salted peanuts.

Sales expenses include cash discounts, brokerage fees, advertising and promotion, and the cost of transporting finished goods (freight-out). A cash discount of 2 percent will be given if payment is made within 10 days of delivery; it is assumed that half of the gross sales will carry this cash discount. Brokerage fees will amount to about 5 percent of the gross revenues, as will advertising and promotional expenses.

Freight-out costs are given in the transportation analysis. For shipping 8 million pounds yearly to the southeastern market, the cost for Albany is $166,000 and the cost for Suffolk is $235,000. For shipping 16 million pounds yearly to the eastern market, the cost for Albany is $392,000 and the cost for Suffolk is $464,000. Based on the demand analysis in a previous section, the consumption of salted peanuts in 1979 was estimated at 265 million pounds in the nation, about 137 million pounds in the eastern market, and 48 million pounds in the southeastern market region. It is logical to assume that an 8-million-pounds-per-year plant would sell its product in the southeastern market, while a 16-million-pounds-per-year plant would sell its product in the eastern market.

All expenses incurred in the processing and marketing of salted peanuts are summarized by plant size and location in Table 15. Southwest Georgia has a slight advantage over Suffolk in variable costs and in general expenses. Sales expenses are about the same in southwest Georgia and Suffolk except for the slight difference in freight-out costs noted above. Total cost per pound in southwest Georgia was estimated at about 123 cents for a 2,000-pounds-per-hour plant and 122 cents for a 4,000-pounds-per-hour plant. Costs for comparable plant sizes are approximately 2 cents higher in Suffolk.

Taxes and potential profits -- A summary statement of estimated costs and profits for the two salted peanut production and marketing operations in southwest Georgia and Suffolk are presented in Table 16. The table includes income, profit margin, return on total assets, and payout period. Net income before taxes is derived by deducting variable costs, sales expenses, out-of-pocket-fixed costs, and depreciation from gross sales.

Federal taxes on corporate income are 48 percent, and state corporate taxes are 6 percent in Georgia and 5 percent in Virginia. After these taxes are deducted, net income for a 2,000-pounds-per-hour plant is $2,434,209 in southwest Georgia as opposed to $2,386,323 in Suffolk. For a 4,000-pounds-per-hour plant, net income is $4,942,928 in southwest Georgia as opposed to $4,887,555 in Suffolk. Southwest Georgia has a slightly favorable margin over Suffolk.

Based on the given net incomes, profit margins are estimated at about 16 percent, returns on total assets vary from 81 percent to 88 percent, and payout periods are projected a little over one year. In general, southwest Georgia has a slightly favorable margin over Suffolk. The details are given in Table 16.

Table 1. Investment requirements on land and building for two given plant sizes and two locations for salted peanut processing, 1981.

	Plant Size in Pounds Per Hour	
	2,000	4,000
Space Estimates		
Land in Acres	1	2
Building Space in Square Feet		
Office	600	1,000
Plant	3,000	5,000
Storage	12,000	20,000
Total	15,600	26,000
Cost Estimates		
Southwest Georgia:		
Land ($13,000 per acre)	$ 13,000	$ 26,000
Building ($20.00 per square foot)	312,000	520,000
Total	$ 325,000	$ 546,000
Suffolk, Virginia:		
Land ($14,000 per acre)	$ 14,000	$ 28,000
Building ($21.36 per square foot)	333,216	555,360
Total	$ 347,216	$ 583,360

Tables 2. Investment requirements on continuous salted peanut processing equipment based on capacity 2,000-and 4,000-pound-per-hour plant, 1981.

	Pounds Per Hour	
	4,000	2,000
CLEANING SECTION*		
Elevator/Conveyor	$ 8,600	$ 8,600
Cleaning Screen	6,400	5,500
Elevator/Conveyor	7,500	7,500
Gravity Table	11,250	9,650
Bag House Dust Collector	10,700	8,700
De-Stoner	1,550	1,550
Feed Hoppers	4,600	4,200
Subtotal	50,600	45,700
ROASTING, BLANCHING, SORTING SECTION*		
Elevator/Conveyor	9,100	9,100
Continuous Roaster	88,000	57,000
Elevator/Conveyor	10,200	10,200
Blanchers with Skin Collectors	33,000	17,100
Elevator Conveyor	9,800	9,800
Electronic Sorter with Dust Collector	43,200	22,600
Inspection Table	7,600	3,800
Elevator/Conveyor	10,500	10,500
Special Feed Hoppers	10,600	7,800
Belt Conveyor	2,600	-
Recycling Elevator/Conveyor	6,200	-
Subtotal	230,800	147,900
FRYING AND SALTING SECTION		
Special Feed Hopper on Casters	3,600	3,200
Fryer, Cooler, Salter, Glaser	73,000	35,000
Oil Storage Tank	1,500	900
Oil Filter	7,200	4,500
Subtotal	85,300	43,600
PACKAGING SECTION		
Distributing Elevator Conveyor	38,300	18,200
Manual Fill & Seal Assembly for Larger Preformed Packages	9,500	9,500
High Speed Form/Fill/Seal Machine for Small Packages	108,000	63,000
Feed and Surge Hoppers	12,500	8,900
Vacuum Can Closing Machine	46,000	-
Vacuum Pump	9,300	-
Filler & Can Handling Equipment	18,000	-
Subtotal	241,600	99,600
ADDITIONAL SERVICES		
Easy-Let-Down Chutes for Surge Hopper	$ 12,300	$ 8,500
Erection and Start-up Supervision	57,000	28,700
Starters, Wiring, Lighting, etc.	23,000	13,500
Spare Parts for 2 Years Operation	35,000	23,000
Estimated Freight**	18,000	12,000
Subtotal	145,300	85,700
Total	$ 753,600	$ 422,500

* Not required if processing blanched peanuts.
**Depending on plant location.

Source: Neumunz, Inc., Leonia, New Jersey 07605

Table 3. Auxiliary equipment for operating, testing, and office use in salted peanut plants and estimated costs, 1981.

Item	2,000 Pounds Per Hour		4,000 Pounds Per Hour	
	Number	Cost	Number	Cost
Electric Forklift	1	$ 18,000	2	$ 36,000
Battery and Charger	1	7,000	2	14,000
Air Compressor	1	2,000	1	2,500
Pallets	300	1,500	450	2,250
Testing Equipment	1	1,000	1	1,600
Fire Protection		9,000		15,000
Office Furniture		9,000		15,000
Office Machines		5,000		7,500
Miscellaneous		3,500		5,150
Total		$ 56,000		$ 99,000

Table 4. Working capital requirements for salted peanut processing, by plant size and location, 1981.

Location	Plant Size in Pounds Per Hour	One Month Finished Goods	Two Months Raw Materials	Total
Southwest Georgia	2,000	$ 1,260,000	$ 832,000	$ 2,092,000
	4,000	2,519,000	1,665,000	4,184,000
Suffolk, Va.	2,000	$ 1,260,000	$ 847,000	$ 2,107,000
	4,000	2,519,000	1,694,000	4,213,000

Table 5. Annual raw material requirements and estimated costs for salted peanut processing, by plant size and location, 1981.

	Raw Material Input in Pounds		Southwest Georgia		Suffolk, Va.	
	Per Hour	Per Year	Unit Price	Annual Cost	Unit Price	Annual Cost
			For a 2,000-Pounds-Per-Hour Plant			
Shelled Peanuts	2,139	8,556,000	55¢	$ 4,705,800	56¢	$ 4,791,360
Salt	40	160,000	7¢	11,200	7¢	11,200
Vegetable Oil	142	568,000	40¢	227,200	40¢	227,200
Others				50,000		50,000
Total				$ 4,994,200		$ 5,079,760
			For a 4,000-Pounds-Per-Hour Plant			
Shelled Peanuts	4,278	17,112,000	55¢	$ 9,411,600	56¢	$ 9,582,720
Salt	80	320,000	7¢	22,400	7¢	22,400
Vegetable Oil	284	1,136,000	40¢	454,400	40¢	454,400
Others				100,000		100,000
Total				$ 9,998,400		$10,159,520

Table 6. Annual requirements for containers and estimated costs by plant size, 1981.

Type of Container	Case Size[1/]	No. of Cases	Cost Per Case	Annual Cost
		For a 2,000-Pounds-Per-Hour Plant		
Can	24/6.5	100,000	$ 4.20	$ 420,000
Can	12/13	300,000	4.00	1,200,000
Bag	160/1.5	80,000	2.50	200,000
Bag	96/3	50,000	2.30	115,000
Bag	64/5	100,000	2.20	220,000
			Total	2,155,000
		For a 4,000-Pounds-Per-Hour Plant		
Can	24/6.5	200,000	$ 4.20	$ 840,000
Can	12/31	600,000	4.00	2,400,000
Bag	160/1.5	160,000	2.50	400,000
Bag	96/3	100,000	2.30	230,000
Bag	64/5	200,000	2.20	440,000
			Total	$ 4,310,000

1/ Number of cans or bags per case and ozs. of salted peanuts per can or bag.

Table 7. Labor requirements and estimated annual costs, by job title and by given locations, for salted peanut processing, 1981.

Job Classification	Hourly Rate	2,000 Pounds Per Hour		4,000 Pounds Per Hour	
		No.	Annual Cost	No.	Annual Cost
		Southwest Georgia			
Foreman	$ 6.5	2	$ 26,000	2	$ 26,000
Production Line	5.5	6	66,000	10	110,000
Maintenance	6.5	2	26,000	2	26,000
Packaging	5.0	4	40,000	8	80,000
Receiving and Shipping	5.5	4	44,000	7	77,000
Cleanup and Odd Jobs	4.0	2	16,000	2	16,000
Subtotal		20	$ 218,000	31	$ 335,000
Fringe Benefits, 15%			32,700		50,250
Total			$ 250,700		$ 385,250
		Suffolk, Virginia			
Foreman	$ 7.0	2	$ 28,000	2	$ 28,000
Production Line	6.0	6	72,000	10	120,000
Maintenance	7.0	2	28,000	2	28,000
Packaging	5.5	4	44,000	8	88,000
Receiving and Shipping	6.0	4	48,000	7	84,000
Cleanup and Odd Jobs	4.5	2	18,000	2	18,000
Subtotal		20	$ 238,000	31	$ 366,000
Fringe Benefits, 15%			35,700		45,900
Total			$ 273,700		$ 420,900

Table 8. Estimated utility costs for the processing of salted peanuts, by plant size and location, 1981.

Plant Size in Pounds Per Hour	Annual Output in Pounds	Southwest Georgia		Suffolk, Va.	
		Cost Per 100 Pounds Output	Annual Cost	Cost Per 100 Pounds Output	Annual Cost
2,000	8,000,000	70¢	$ 56,000	98¢	$ 78,400
4,000	16,000,000	65¢	$ 104,000	91¢	$ 145,600

Table 9. Administrative personnel requirements and estimated salary costs for salted peanut plants, by plant size and location, 1981.

Personnel	2,000 Pounds Per Hour			4,000 Pounds Per Hour		
	Number	Annual Cost		Number	Annual Cost	
		Southwest Georgia	Suffolk, Virginia		Southwest Georgia	Suffolk, Virginia
Plant Manager	1	$ 20,000	$ 22,000	1	$ 25,000	$ 27,000
Stenographer	1	10,000	11,000	1	10,000	11,000
Production Clerk	1	9,000	10,000	2	18,000	20,000
Bookkeeping	2	20,000	22,000	3	30,000	33,000
Billing Clerk	1	10,000	11,000	2	20,000	22,000
Subtotal		69,000	76,000		103,000	113,000
Fringe Benefits, 15%		10,350	11,400		15,450	16,950
Total		$ 79,350	$ 87,400		$ 118,450	$129,950

Table 10. Annual depreciation expenses on building and equipment for salted peanut processing, by plant size and location, 1981.

Item	Life (Year)	2,000 Pounds Per Hour		4,000 Pounds Per Hour	
		Value	Annual Depreciation	Value	Annual Depreciation
		Southwest Georgia			
Building	20	$312,000	$ 15,600	$ 520,000	$ 26,000
Machinery	10	422,500	42,250	753,600	75,360
Auxiliary Equipment	7	56,000	8,000	99,000	14,143
Total			$ 65,850		$ 115,503
		Suffolk, Virginia			
Building	20	$333,216	$ 16,661	$ 555,360	$ 27,768
Machinery	10	422,500	42,250	753,600	75,360
Auxiliary Equipment	7	56,000	8,000	99,000	14,143
Total			$ 66,911		$ 117,271

Table 11. Annual interest expenses for salted peanut processing, by plant size and location, 1981.

Southwest Georgia	Principal Plant Size in Pounds Per Hour		Annual Interest Rate	Annual Interest Plant Size in Pounds Per Hour	
	2,000	4,000		2,000	4,000
Fixed Capital	$ 803,500	$ 1,398,600	15%	$ 120,525	$ 209,790
Working Capital	2,092,000	4,184,000	15%, 6 mos.	156,900	313,800
Total				$ 277,425	$ 523,590
Suffolk, Virginia					
Fixed Capital	$ 825,716	$ 1,435,960	15%	$ 122,357	$ 215,394
Working Capital	2,107,000	4,213,000	15%, 6 mos.	158,025	315,975
Total				$ 280,382	$ 531,369

Table 12. Property value and annual ad valorem taxes by plant size and location (salted peanuts), 1981.

Location	2,000 Pounds Per Hour			4,000 Pounds Per Hour		
	Property Value	Assessed Value	Tax	Property Value	Assessed Value	Tax
Southwest Georgia	$ 803,500	$ 321,400	$ 6,900	$1,398,600	$ 559,440	$12,011
Suffolk, Virginia:						
Real estate	$ 347,216	$ 347,216	$ 3,298	$ 583,360	$ 583,360	$ 5,542
Machinery	478,500	47,850	1,914	852,600	85,260	3,410
Total			$ 5,212			$ 8,952

NOTE: See text for assessment percentage and tax rates.

Table 13. Annual insurance costs for a salted peanut processing plant, by plant size and location, 1981.

Location	Plant Size in Pounds Per Hour	Plant Building, Machinery and Equipment		Raw Materials and Finished Goods		Total Insurance Costs
		Value	Insurance Costs	Value	Insurance Costs	
Southwest Georgia	2,000	$ 791,000	$ 1,266	$ 838,000	$ 2,011	$ 3,277
	4,000	1,373,000	2,197	1,676,000	4,022	6,219
Suffolk, Virginia	2,000	$ 812,000	$ 1,973	$ 841,000	$ 3,440	$ 5,413
	4,000	1,408,000	2,421	1,683,000	6,883	10,304

NOTE: See text for insurance rates.

Table 14. Annual gross sales of salted peanuts by type of container and by plant size, 1981.

Type of Container	Case Size[1/]	Net Weight in Pound Per Case	Pounds	No. of Cases	Delivered Price Per Case	Annual Gross Sales
			2,000-Pounds-Per-Hour Plant			
Can	24/6.5	9.75	975,000	100,000	$ 18.90	$ 1,890,000
Can	12/13	9.75	2,925,000	300,000	18.00	5,400,000
Bag	160/1.5	15.00	1,200,000	80,000	29.50	2,360,000
Bag	96/3	18.00	900,000	50,000	35.28	1,764,000
Bag	64/5	20.00	2,000,000	100,000	37.00	3,700,000
			8,000,000			$ 15,114,000
			4,000-Pounds-Per-Hour Plant			
Can	24/6.5	9.75	1,950,000	200,000	$ 18.90	$ 3,780,000
Can	12/13	9.75	5,850,000	600,000	18.00	10,800,000
Bag	160/1.5	15.00	2,400,000	160,000	29.50	4,720,000
Bag	96/3	18.00	1,800,000	100,000	35.28	3,528,000
Bag	64/5	20.00	4,000,000	200,000	37.00	7,400,000
			16,000,000			$ 30,228,000

1/ Number of cans or bags per case and ozs. of salted peanuts per can or bag.

Table 15. Estimated annual costs and earnings of typical salted peanut plant, by plant size and location, 1981.

	Southwest Georgia		Suffolk, Virginia	
	Size in Pounds Per Hour		Size in Pounds Per Hour	
Sales	2,000	4,000	2,000	4,000
Volume (pounds)	8,000,000	16,000,000	8,000,000	16,000,000
Dollars (Table 14)	$ 15,114,000	$ 30,228,000	$ 15,114,000	$ 30,228,000
Sales Expenses				
Cash Discount, 2% of 1/2 sales	151,140	302,280	151,140	302,280
Brokerage Fees, 5%	755,700	1,511,400	755,700	1,511,400
Advertising and Promotion, 5%	755,700	1,511,400	755,700	1,511,400
Freight Out	166,000	392,000	235,000	464,000
Subtotal	1,828,540	3,717,080	1,897,540	3,789,080
Variable Costs				
Raw Materials (Table 5)	4,994,200	9,988,400	5,079,760	10,159,520
Containers (Table 6)	2,155,000	4,310,000	2,155,000	4,310,000
Labor (Table 7)	250,700	385,250	273,700	420,900
Utilities (Table 8)	56,000	104,000	78,400	145,600
Miscellaneous	75,000	148,000	76,000	150,000
Subtotal	7,530,900	14,935,650	7,662,860	15,186,020
Fixed Costs				
Administrative (Table 9)	79,350	118,450	87,400	129,950
Depreciation (Table 10)	65,850	115,503	66,911	117,271
Interest (Table 11)	277,425	523,590	280,382	531,369
Ad Valorem Taxes (Table 12)	6,900	12,011	5,212	8,952
Insurance (Table 13)	3,277	6,219	5,413	10,304
Miscellaneous	30,000	54,000	31,000	56,000
Subtotal	462,802	829,773	476,318	853,846
Total Costs	$ 9,822,242	$ 19,482,503	$ 10,036,718	$ 19,828,946
Per Pound Cost in Cents				
Sales Expenses	22.86	23.23	23.72	23.68
Variable Costs	94.14	93.35	95.79	94.91
Fixed Costs	5.78	5.19	5.95	5.34
Total Costs	122.78	121.77	125.46	123.93

Table 16. Summary statement of estimated costs and profits of salted peanut plants, based on plant sizes and locations, 1981.

Income	Southwest Georgia Size in Pounds Per Hour 2,000	Southwest Georgia Size in Pounds Per Hour 4,000	Suffolk, Virginia Size in Pounds Per Hour 2,000	Suffolk, Virginia Size in Pounds Per Hour 4,000
Gross Sales	$ 15,114,000	$ 30,228,000	$ 15,114,000	$ 30,228,000
Variable Costs	7,530,900	14,935,650	7,662,860	15,186,020
Variable Profit	7,583,100	15,292,350	7,451,140	15,041,980
Sales Expenses	1,828,540	3,717,080	1,897,540	3,789,080
Out-of-pocket Fixed Costs	396,952	714,270	409,407	736,575
Cash Income	5,357,608	10,861,000	5,144,193	10,516,325
Depreciation	65,850	115,503	66,911	117,271
Net Income before Taxes	5,291,758	10,745,497	5,077,282	10,399,054
Federal Taxes, 48%	2,540,044	5,157,839	2,437,095	4,991,546
State Taxes*	317,505	644,730	253,864	519,953
Net Income	$ 2,434,209	4,942,928	2,386,323	4,887,555
Profitability Indicators				
Profit Margin, %	16.11	16.35	15.79	16.17
Return on total assets, %	84.07	88.54	81.37	86.52
Payout period, years	1.2	1.1	1.2	1.1

*State corporate income taxes: Georgia 6% and Virginia 5%.

COMPARATIVE PLANT AND OPERATING COST ANALYSIS FOR PEANUT OIL PROCESSING

The processing of peanut oil consists of two separate operations: crude oil crushing and edible oil refining. In fact, crushing and refining are two different industries. Peanut oil crushing is generally integrated with the shelling operation. Nearly all peanut crushers and shellers are located in the three peanut-producing regions: the southeastern region, the southwestern region, and the Virginia-Carolina region.

Crude peanut oil is generally refined into edible grade in a vegetable oil refining plant in which peanut oil is only a small portion of its operation. These refining plants produce a high volume of edible vegetable oils, such as soybean, cottonseed, corn, and peanut, in order to be competitive in the market. The distribution of these refining plants is more closely related to areas producing soybeans, cotton, and corn than to the three peanut-producing regions.

According to trade sources, crude oil crushers and refining plants are operated 24 hours a day and seven days a week. However, peanut oil crushers can operate only certain months a year because of the lack of raw peanuts for crushing purposes. This is especially true in the Virginia-Carolina and the southwest regions.

It became increasingly obvious in the course of interviews with peanut oil producers, as well as other agencies, that there is idle capacity in the peanut oil crushing business even under normal crop conditions for peanuts. The present tight supply of shelled peanuts for edible purposes has reduced the volume for oil crushing to an insignificant proportion. Consequently, this study will not present investment requirements and detailed production costs either for a crushing plant or for a refining plant. If the supply of peanuts for crushing could be increased significantly in the foreseeable future, the idled capacities naturally would be utilized first. Since peanuts from CCC stocks are the predominant source, future directions in government peanut programs must be evaluated. Any investment in a new peanut-crushing plant appears premature at the present time. Also, investment in new refining facilities solely for peanut oil is not practical.

BIBLIOGRAPHY

F. W. Dodge Company, A Division of McGraw-Hill, Inc. Dodge Building Cost Indexes for U. S. and Canadian Cities. September 1981.

Southwest Georgia Planning and Development Commission. Peanut Processing Opportunities. Camilla, Georgia, June 1972.

Woodroof, Jasper Guy. Peanut Production, Processing, Products. The AVI Publishing Company, Inc. Westport, Connecticut, 1966.

ACKNOWLEDGEMENTS

The authors wish to express appreciation to all persons who have offered their time and information to help make this study possible. Although it is impossible to list everyone, credit to major sources is given in this section.

Peanut Product Producers

Holsum Foods, Albany, Georgia
Robert A. Pedigo, Branch Manager

Kathryn Beich Candies, Bloomington, Illinois
Rita K. Fogler, Manager

Primrose Candy Company, Chicago, Illinois
Frank E. Punch, President

Stuckey's Inc., Eastman, Georgia
Tom Halaska, Director of Manufacturing

Tom's Foods, Columbus, Georgia
Ben Smith, Director of Distribution

Equipment Suppliers

The Hoshall Company, Doraville, Georgia
Henry Hicks

Neumunz, Inc., Leonia, New Jersey
Peter R. Isler

Transporters

Family Lines System, Atlanta, Georgia
John Mathis, Rate Department

Overnite Transportation
Billy Turner, Atlanta, Georgia

Roadway Express, Inc.
Karen S. Elfrink, Akron, Ohio
Roger Seidel, Atlanta, Georgia

Southern Railway System, Atlanta, Georgia
D. L. Lanford, Director -- Revenue Accounting
R. A. Marcum, Central Rate Bureau

Associations and Others

Atlanta Gas Light Company
James R. Beverly, Rate Engineer

A. H. Carmichael Company
J. Broadus Carmichael, Atlanta, Georgia

F. W. Dodge Company
David Cox, Atlanta, Georgia

Georgia Agricultural Commodity Commission for Peanuts
J. Tyron Spearman, Coordinator
Tifton, Georgia

Georgia Power Company, Atlanta, Georgia
Bill Kubler

Lawyers Title Insurance Corporation, Atlanta, Georgia
Susan E. Reid, Title Attorney

Peanut Butter and Nut Processors Association
James E. Mack, Director, Washington, D. C.

H. G. Ray Company, Inc., Atlanta, Georgia
H. G. Ray